Kent Rare Plant Register

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group

Issue date: **May 2025**

Species accounts

This is an alphabetical series of accounts of the Kent rare plant species, split into separate Parts A, B, etc. including photographs, analyses of trends, distribution maps and site details. They were prepared over the period 2011-2023 and annually updated in the light of new records and information.

These are followed by

Register Appendix A:

Accounts of plants which were once on the register, but which have been removed

Register Appendix B:

'Probably extinct' plants which otherwise would have qualified for the register

Register Appendix C:

How the register was put together

PART A
Adonis annua
Agrostemma githago
Ajuga chamaepitys
Alchemilla filicaulis subsp. vestita
Alchemilla xanthochlora
Allium oleraceum
Alopecurus aequalis
Alopecurus bulbosus
Althaea officinalis
Anacamptis morio
Anthemis arvensis
Anthemis cotula
Arabis hirsuta
Artemisia maritima
Arum italicum subsp. neglectum
Asplenium septentrionale

PART B
Baldellia ranunculoides
Bistorta officinalis
Blitum bonus-henricus
Brassica oleracea var.oleracea
Briza media
Bromus hordeaceus subsp. thominei
Bromus ramosus subsp. benekenii
Bromus secalinus
Buglossoides arvensis
Bupleurum tenuissimum
Buxus sempervirens

PART C (Ca)
Callitriche truncata
Calluna vulgaris
Calystegia soldanella
Campanula glomerata
Campanula rotundifolia
Cardamine bulbifera
Cardamine impatiens
Carex canescens
Carex divisa
Carex echinata
Carex elata
Carex elongata
Carex extensa
Carex lepidocarpa
Carex nigra
Carex panicea
Carex pulicaris
Carex rostrata
Carex vesicaria
Carex vulpina
Carlina vulgaris
Catabrosa aquatica

PART C (Ce-Cy)
Centaurea calcitrapa
Centaurea cyanus
Cephalanthera damasonium
Cerastium arvense
Chaenorhinum origanifolium
Chamaemelum nobile
Chenopodiastrum murale
Chenopodium vulvaria
Cichorium intybus
Cicuta virosa
Cirsium eriophorum
Cladium mariscus
Clinopodium acinos
Clinopodium nepeta
Comarum palustre
Crassula tillaea
Crepis foetida
Cruciata laevipes
Cuscuta epithymum
Cynoglossum officinale
Cyperus longus

PART D
Dactylorhiza incarnata
Dactylorhiza maculata
Daucus carota subsp. gummifer
Descurainia sophia
Dianthus armeria
Dianthus deltoides
Drosera rotundifolia
Dryopteris aemula

PART E
Eleocharis acicularis
Eleocharis multicaulis
Eleocharis quinqueflora
Eleocharis uniglumis
Eleogiton fluitans
Epilobium palustre
Epipactis palustris
Epipactis phyllanthes
Equisetum sylvaticum
Erica cinerea
Erica tetralix
Eriophorum angustifolium
Erodium maritimum
Erophila glabrescens
Eryngium campestre
Ervilia sylvatica
Eryngium maritimum
Erysimum cheiranthoides
Ervilia sylvatica
Euphorbia cyparissias
Euphorbia exigua
Euphrasia confusa
Euphrasia officinalis subsp. anglica
Euphrasia pseudokerneri
Euphrasia tetraquetra

PART F
Fallopia dumetorum
Festuca arenaria
Filago germanica
Filago pyramidata
Fragaria vesca
Frankenia laevis
Fumaria bastardii
Fumaria parviflora
Fumaria reuteri
Fumaria vaillantii

PART G
Galeopsis angustifolia
Galium parisiense
Galium pumilum
Galium uliginosum
Gastridium ventricosum
Genista anglica
Genista tinctoria
Gentianella amarella subsp. amarella
Gentianella amarella subsp. anglica
Geranium purpureum subsp. purpureum
Glaucium flavum
Glebionis segetum
Groenlandia densa
Gymnadenia densiflora

PART H
Helianthemum nummularium
Helosciadium inundatum
Herminium monorchis
Himantoglossum hircinum
Hippophae rhamnoides
Hordeum marinum
Hottonia palustris
Hydrocharis morsus-ranae
Hyoscyamus niger
Hypericum elodes
Hypericum maculatum
Hypericum montanum
Hypochaeris glabra
Hypopitys monotropa

PART I, J & K
Iberis amara
Isolepis cernua
Jacobaea aquatica
Jasione montana
Juncus acutus
Juncus compressus
Juncus ranarius
Juncus squarrosus
Juncus subnodulosus
Juniperus communis
Knautia arvensis

PART L
Lactuca saligna
Lathyrus aphaca
Lathyrus hirsutus
Lathyrus japonicus
Lathyrus linifolius
Lepidium campestre
Lepidium heterophyllum
Lepidium latifolium
Leymus arenarius
Limonium binervosum and segregates
Linaria repens
Linum radiola
Lobelia urens
Logfia minima
Lotus angustissimus
Lysimachia foemina
Lysimachia minima
Lysimachia tenella
Lythrum hyssopifolia

PART M & N
Malva setigera
Medicago minima
Medicago polymorpha
Medicago sativa subsp. falcata
Melampyrum pratense subsp. pratense
Melampyrum pratense subsp. commutatum
Mentha arvensis
Mentha pulegium
Misopates orontium
Moenchia erecta
Myosotis secunda
Myosurus minimus
Myrica gale
Myriophyllum verticillatum
Nardus stricta
Narthecium ossifragum
Neotinea ustulata
Neottia nidus-avis
Nepeta cataria
Nymphoides peltata

PART O (Oe-Orc)
Oenanthe fistulosa
Oenanthe fluviatilis
Oenanthe lachenalii
Oenanthe silaifolia
Omalotheca sylvatica
Onobrychis viciifolia
Ononis spinosa
Ophrys fuciflora
Ophrys insectifera
Ophrys sphegodes
Orchis anthropophora
Orchis purpurea
Orchis simian

PART O (Ore-Ox)
Oreopteris limbosperma
Orobanche caryophyllacea
Orobanche elatior
Orobanche minor subsp. maritima
Orobanche picridis
Orobanche rapum-genistae
Osmunda regalis
Oxalis acetosella
Oxybasis chenopodioides
Oxybasis glauca

PART P (-Polyga)
Parapholis incurva
Parentucellia viscosa
Pedicularis sylvatica
Persicaria minor
Persicaria mitis
Peucedanum officinale
Phelipanche purpurea
Phleum arenarium
Pilosella peleteriana

Plantago media
Platanthera bifolia
Platanthera chlorantha
Polygala amarella
Polygala serpyllifolia

PART P (Polygo-Pyr)
Polygonum oxyspermum subsp. raii
Polygonum rurivagum
Polypodium cambricum
Polypogon monspeliensis
Populus nigra subsp. betulifolia
Potamogeton acutifolius
Potamogeton coloratus
Potamogeton friesii
Potamogeton obtusifolius
Potamogeton pusillus
Potentilla anglica
Potentilla argentea
Potentilla erecta
Prunus cerasus
Puccinellia fasciculata
Puccinellia rupestris
Pyrola rotundifolia
Pyrus pyraster

PART Q & R
Ranunculus arvensis
Ranunculus flammula
Ranunculus hederaceus
Ranunculus parviflorus
Ranunculus peltatus
Ranunculus tripartitus / R. x novae-forestae
Raphanistrum raphanistrum subsp. maritimus
Roemeria argemone
Rosa agrestis
Rosa spinosissima
Rubia peregrina
Rumex crispus subsp. uliginosus
Rumex maritimus
Rumex palustris
Ruppia maritima
Ruppia spiralis

PART S (Sa-Sera)
Sabulina tenuifolia
Sagina nodosa
Salicornia disarticulata
Salicornia emerici
Salicornia fragilis
Salicornia obscura
Salix purpurea
Salix repens
Salsola kali
Salvia pratensis
Salvia verbenaca
Sambucus ebulus
Sanicula europaea
Sarcocornia perennis
Saxifraga granulata
Scandix pecten-veneris
Schoenoplectus tabernaemontani x triqueter
Scleranthus annuus
Serapias vomeracea

PART S (Serr-Su)
Serratula tinctoria
Sibthorpia europaea
Silene conica
Silene flos-cuculi
Silene gallica
Silene noctiflora
Silene nutans
Sium latifolium
Solidago virgaurea
Sonchus palustris
Sparganium natans
Spartina maritima
Spergula arvensis
Spiranthes spiralis
Stachys arvensis
Suaeda vera
Succisa pratensis

PART T
Teesdalia nudicaulis
Teucrium botrys
Thalictrum flavum
Thelypteris palustris
Tilia cordata
Trichomanes speciosum
Trifolium fragiferum
Trifolium glomeratum
Trifolium squamosum
Trifolium suffocatum
Triglochin palustris

PART U & V
Ulex gallii
Umbilicus rupestris
Utricularia vulgaris
Valeriana dioica
Valeriana officinalis subsp. collina
Valeriana officinalis subsp. sambucifolia
Valerianella dentata
Verbascum lychnitis
Veronica officinalis
Veronica scutellata
Vicia bithynica
Vicia lutea
Viola canina
Viola palustris
Viola tricolor subsp. tricolor
Vulpia ciliata subsp. ambigua
Vulpia fasciculata
Vulpia unilateralis

PART W-Z
Wahlenbergia hederacea
Wolffia arrhiza
Zostera marina
Zostera noltei

Kent Rare Plant Register

Species accounts Part A

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date May 2025

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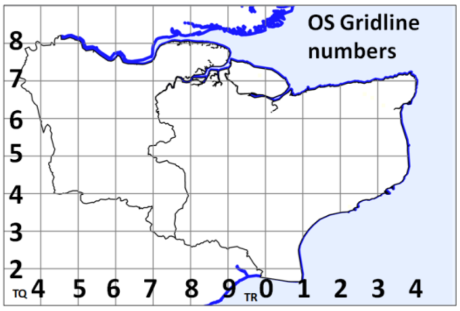
The register formerly included the following species account which may now be found at **Appendix A** of the register, https://bsbi.org/kent

***Agrostis vinealis* (Brown Bent)**

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at **tetrad** (2 x 2km squares) or **monad** (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AG Alfred Gay
AH A.Henderson
AJ Ade Jupp
AL Alex Lockton
AR Alison Ruyter
AW Tony Witts
AWr A. Wright
BB Brian Banks
BW Brian Woodhams
CO Colin Osborne
CS Cath Shellswell
DCh David Chambers
DG Doug Grant
DJ David Johnson
DM Daphne Mills
DMa David May
DS Don Summerley
DT Dan Tuson
EGP Eric Philp
EI & EH E. Ivens & E. Hurr
FB Fred Booth
FR Francis Rose
GK Geoffrey Kitchener
GT Gill Tysoe
J&BH J & B Hodge
JA Jan Armishaw
JB John Badmin
JC Juliet Cairns
JE John Edgington
JN Josie Newman
JP Joyce Pitt
JPu John Puckett
JRP John Palmer
JS Judith Shorter
JT John Tebbit
JW Jo Weightman
KB K. Bresso
KBRG Kent Botanical Recording Group
KFC Kent Field Club
L&DH Lorna & Derek Holland
LBB L. Breda Burt
LC Lou Carpenter
LM Lesley Mason
LR Lliam Rooney
MA Martin Allison
MB Mervyn Brown
ME Michael Easterbrook
MW Martin Wicks
NW Nick Woods
PH Peter Heathcote
PHa Peter Hall
PR Paul Restorick
PRo Peter Robinson
PS Pamela Smith
RF Lady Rosemary FitzGerald
RM Richard Moyse
RMB Rodney Burton
RR Rosemary Roberts
SB Sue Buckingham
SC Steve Coates
SCo Sean Cole
SE Sarah Emanuel
SG Simon Ginnaw
SK Sarah Kitchener
SL Stephen Lemon
SP Sue Poyser
SW & PPM Steve Weeks & Phillippa Morrison-Price
TH T. Hurst
TS Terry Swainbank
WFS Wild Flower Society
WR W. Ridley

Other abbreviations and references:

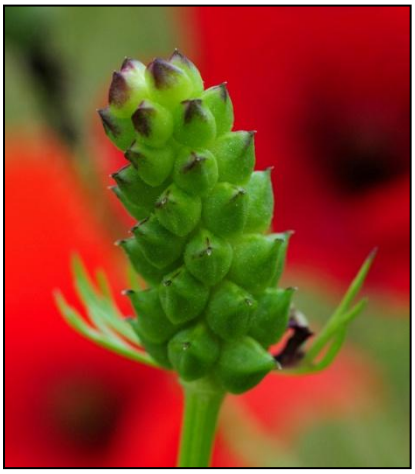
BM = Natural History Museum herbarium	KCC = Kent County Council	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	KWT = Kent Wildlife Trust	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
Hanbury & Marshall (1899) refers to their *Flora of Kent*	MNE = Maidstone Museum Herbarium	RNR = roadside nature reserve

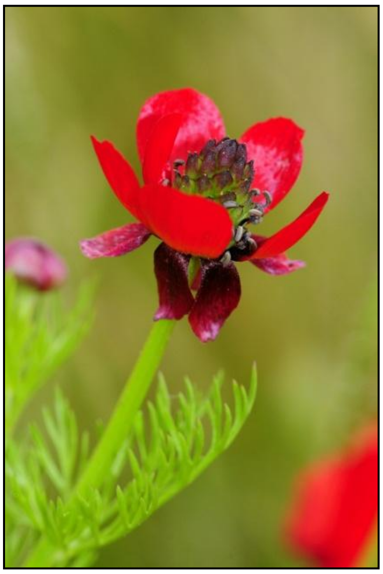
Adonis annua L. (Pheasant's-eye)

vc 15 and 16

Rarity / scarcity status

Adonis annua is probably an archaeophyte, or ancient introduction; fairly widespread but extremely local in Britain, with most recent records being in the south and north east. It is regarded as **Endangered** in England and in Great Britain as a whole, and it is included as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. It is **nationally scarce** and in Kent, it is **rare**. It is a Kent axiophyte and so is indicative of good habitat.

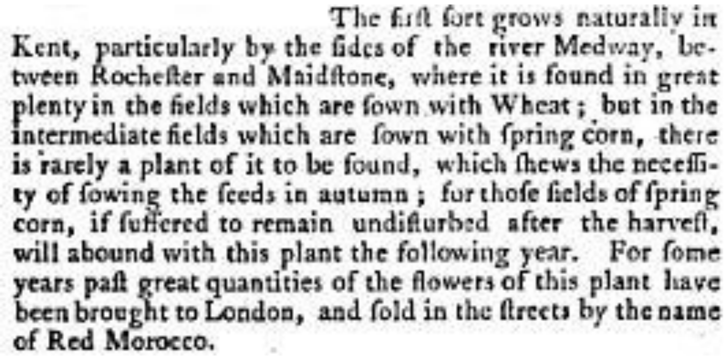




Kingston. Photos by Lliam Rooney, 8 July 2014

Account

Adonis annua is an annual plant of well-drained dry chalky arable or disturbed ground, formerly well-established in cornfields, although local. It was first listed for Kent by Christopher Merret (1666) at Roe Hill (presumably Rowhill near Wilmington), and older records treat it as particularly plentiful around Dartford and Greenhithe, although also present in other localities across the county. Philip Miller's *Gardeners Dictionary*, which went through numerous editions from 1731, mentions this species as in Kent; and some additional content incorporated between 1752 and 1771 in the Abridgement is particularly informative:



The firſt ſort grows naturally in Kent, particularly by the ſides of the river Medway, between Rocheſter and Maidſtone, where it is found in great plenty in the fields which are ſown with Wheat; but in the intermediate fields which are ſown with ſpring corn, there is rarely a plant of it to be found, which ſhews the neceſſity of ſowing the ſeeds in autumn; for thoſe fields of ſpring corn, if ſuffered to remain undiſturbed after the harveſt, will abound with this plant the following year. For ſome years paſt great quantities of the flowers of this plant have been brought to London, and ſold in the ſtreets by the name of Red Morocco.

Presumably the local name of Red Morocco was based on colour resemblance to red morocco leather used, e.g., in book-binding. Notwithstanding its abundance as a crop weed in the 18th century, even in the 1890s (Hanbury & Marshall, 1899), *Adonis annua* was regarded as decreasing through improved cultivation[1]. This trend has continued towards near-disappearance. By the 1950s it was regarded by Francis Rose (in his manuscript *Flora of Kent*) as very rare and confined to a few localities, so the species appears to have been particularly sensitive to early changes in agricultural practices, probably beginning with improved seed cleaning methods which restricted its distribution as a contaminant of cereal seed.

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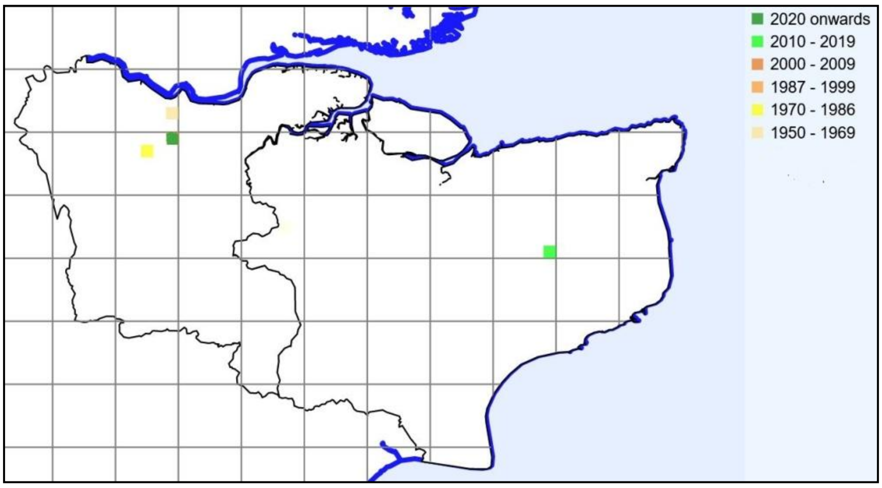
[1] A decrease in Kent was claimed by Thomas Flower between 1846 and 1849, at least in cornfields ranging from the neighbourhood of Gravesend to Rochester, Canterbury, Sandwich, Walmer, Dover and Folkestone; he suggested that this was evidence of the plant not being truly wild, by implication depending on (re)introduction in the course of corn cultivation - Flower, T.B. (1852), Note on Adonis autumnalis, *Phytologist* **5**: 470.



Adonis annua **Kent records to 2024 mapped at tetrad level, from** BSBI **database. (Introductions are omitted and not all pre-2010 records are in the database.)**

Arable field margins in the vicinity of Longfield / Fawkham have been an area of sporadic occurrence, but with a gap from 1995 to 2021, when photographic evidence of its re-appearance emerged, followed in 2024 with news from the farmer that it was present in June of that year. In East Kent there have been a couple of reports, including a single occurrence near Dover in 1996, and most recently (2014) a record of seven plants near Kingston in a location known to Natural England, but where flowering does not take place every year. The Kingston site is by a wide arable margin on a loamy soil over chalk. Associated plants included *Helminthotheca echioides, Lapsana communis, Lysimachia (Anagallis) arvensis, Myosotis arvensis, Papaver rhoeas, Sison (Petroselinum) segetum, Sonchus asper, Tripleurospermum inodorum,* and *Viola arvensis*. *Vulpia myuros* had become dominant in July 2013 with *Anisantha sterilis* (Barren Brome) and may well have smothered *Adonis*, which was not seen flowering that year, but was controlled for 2014 by herbicidal treatment. Subsequent attempts to encourage re-appearance of *Adonis* included spring cultivations, further herbicidal treatment to control *Helminthotheca echioides* prior to ploughing, and autumn cultivations; but at least until 2020 it had not reappeared[2].

It has also been seen in East Kent (2020) as an obvious constituent of ‘wildflower’ seed sowing.

Seed production is low (see Kent experimental data below) and the relatively heavy seeds limit the species’ ability to spread and escape herbicidal treatment, although seed longevity provides scope for the plant to re-appear when ground is disturbed. Germination is mostly autumnal, but can occur in spring. Seed dormancy appears to require exposure to warm, dry conditions for embryo development and then alternation with cool, wet conditions to enable decay of the hard seed coat. Normal flowering is from May to mid-July, with seeds shed onto the soil surface for ripening in the summer warmth, but Kent flowering records continue into September.

Re-introduction has been studied at Ranscombe Farm with the sowing of 7,200 seeds at the rate of 100 seeds per square metre on prepared ground spread across two plots, one plot on calcareous free-draining chalk and the other on calcareous clay-with-flints, at the end of July 2019. This resulted by May next year in 110 plants in total across the two plots, with a germination and survival rate of 1.5%. The calcareous chalk plot had 108 small plants. The germination and survival rate was 3.0%, and there was an average of 1.4 flowers per plant, and potentially 170[3] seeds per plant, based on the number of seed-heads, flowers and flower-buds counted. The loamy clay-with-flints area had two plants, although they were much bushier with a greater number of flower heads than on the comparison plot; the germination and survival rate was 0.06%, with an average of 9 flowers and potentially 219.5 seeds per plant. While no plants were seen at the introduction sites in 2022, on 15 May 2023 two flowering plants were seen in Prebbles margin, TQ 71453 67581, and 135 in the Valley, below the North Downs Way, TQ 70776 67516 to TQ 70801 67506, some 135 flowering plants in the Valley, below the North Downs Way.

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[2] Actions are described, together with much of the following information, in Shellswell, C.H., Blackler, R., Mitchell, A., Moyse, R. and Waller, M (eds.) (2021) *Looking after Pheasant’s-eye Adonis annua*: Ecology and Conservation Portfolio. Plantlife, Salisbury https://naturebftb.co.uk/wp-content/uploads/2021/05/Adonis_annua_FINAL_LOWRES-17.05.21.pdf

As for identification, *Adonis annua* cannot readily be mistaken for any other British species, but when young, its divided leaves make it difficult to pick out in the field from *Tripleurospermum inodorum* (Scentless Mayweed) and related weeds.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
North of Eynsford	TQ5466		27 October 1974	RMB	TQ 5405 6657, two plants in barley stubble in a chalky field, mentioned in Lousley, Botanical Records for 1974, *London Nat*. **54**: 63-65 (1975).
Near Fawkham	TQ56Z (this tetrad includes the grid references below)		(1) After 1990, before 2006 (2) August 1995	(1) EGP (Philp, 2010) (2) JP	(1) Given in BSBI database as Mile End Green. (2) Arable edge west of Churchdown Wood, 20+ plants with *Scandix, Legousia*, etc., probably from seed bank exposed when chalk bank cut into - see *KFC Bulletin* (1996) **41**: 56.
Dean Bottom	TQ5868		(1) Summer 2021 (2) 20 Sept 1995	(1) Anon (2) JP	(1) Reported with photographic evidence from an arable field margin which appears to be in TQ5868. (2) Three plants at TQ 589 685.
Dean Bottom	TQ5968		1998	JP	TQ 594 685, near Longfield Field.
East of Churchdown Wood, Fawkham	TQ5968		21 Sep 1985	GK	TQ 596 681; several dozen plants in chalky field, recently ploughed and re-seeded to grass.
Near Churchdown Wood, Fawkham	TQ596[9]		15 July 1998	JP	Field boundary near Churchdown Wood.
East Malling	TQ7055		August 1980	FB	TQ 703 558, with *Consolida ajacis*, one plant at Rocks Farm, said to have been present from time to time in early 1930s when cereals were grown (cereals recommenced on this farm by research station, 1980).
Torry Hill estate	TQ9158		3 June 1992	MN	
St.Margaret's, near Dover	TR3745		25 July 1996	SB	One plant on edge of arable field near cliff top. It was also recorded by Scott at radar station, St Margaret's Bay, 1939.
Kingston	TR1850		1 July 2014	SB	Seven plants within c. 5m of a wide arable margin on a loamy soil over chalk. Associated plants: *Helminthotheca echioides*, *Lapsana communis*, *Lysimachia (Anagallis) arvensis*, *Myosotis arvensis*, *Papaver rhoeas*, *Sison (Petroselinum) segetum*, *Tripleurospermum inodorum*, *Viola arvensis*. The farmer was operating a High Level Stewardship scheme with Natural England to encourage arable plants.

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[3] Apparently misstated as 17.6 seeds at p.15 of Shellswell *et al*. (2021), since it is given as 170 on p.3.

Agrostemma githago L. (Corncockle)

vc 15 and 16

Rarity / scarcity status

Nationally, *Agrostemma githago* was believed to be extinct so far as concerned its archaeophytic status as an arable field weed; but there have been widespread recent occurrences deriving from 'wild flower' seed mixes of non-UK origin. This gives rise to difficulty in distinguishing plants which may still arise from the buried seed bank. Without genetic markers being found to separate UK material, the extent of that material and the threats faced by it are problematic to determine. Accordingly, no threat category has been assigned for England or for Great Britain as a whole, and the species has been placed on the 'Waiting List'.

In Kent, it fulfils the criteria to be treated as at least locally **scarce**, provided that occurrences where potentially sown or escaped are discounted.

Ranscombe Farm. Photo by Lliam Rooney, 8 July 2010

Account

Agrostemma githago was originally a widespread plant of fields and waste ground, with a long-standing arable association. Charred plant material found with a corn drier of the late second / third century in a Romano-British site at Swanscombe included weed seeds, of which 16% consisted of *Agrostemma githago*[4]. A further Romano-British site at Beechbrook Wood, Hothfield yielded four seeds amongst cereal and arable weed seeds in a possible cremation burial context, perhaps deriving from tinder material for the cremation[5]. Seeds were also found in late Roman and mediaeval contexts, in the course of excavations for the HS1 rail route around Northumberland Bottom, Southfleet[6], where rye grains were also a significant part of deposits associated with mediaeval kiln-drying activities. There is a further mediaeval context (early 13th to late 14th century) for its identification with charred grain seed at Westwood, Thanet[7]. Also at Thanet, but at Manston Road, charred plant material associated with a mid-11th to early 13th century oven included corncockle as well as wheat, barley and oat grains[8]. Godwin (1975)[9] mentions a possible biological link between rye and *Agrostemma githago*, as also that contamination of flour by corncockle in the crop produced high levels of saponin, increasing susceptibility to leprosy. This disease was known in Kent by the 7th century (evidenced by a skeleton in the Anglo-Saxon cemetery at Eccles) and leper houses or hospitals were established in the county from 1084 (St Nicholas, Harbledown) to 1384 (Holy Trinity, Boughton under Blean), segregation providing a level of control.

The first conventional botanical record for the county, however, was by Thomas Johnson in July 1629, en route between Gravesend and Rochester[10]. In the nineteenth century it could be found in cornfields everywhere, although by the end of that century its wide distribution was tempered by recognition that it was not plentiful

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[4] J. Giorgi. *The environmental archaeology*. In A. MacKinder, Museum of London Archaeology (2010). *A Romano-British site at Swanscombe, Kent*.

[5] J. Giorgi. *The charred plant remains from Beechbrook Wood, Hothfield, Kent (ARC BBW00).* CTRL Specialist Report.

[6] Davis, A. (2006). *The charred plant remains from Northumberland Bottom, Southfleet, Kent (ARC WNB 98).* CTRL Specialist Report.

[7] Powell, A.B. (n.d.) Baking and brewing in a mediaeval settlement at Star Lane, Westwood, Thanet. Wessex Archaeology.

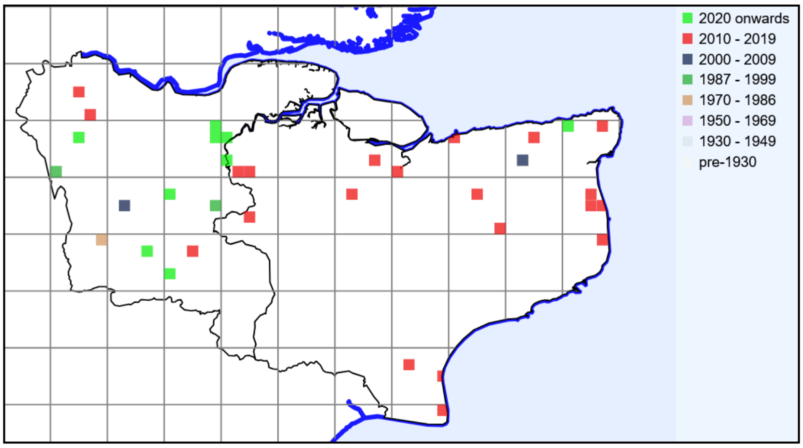
[8] Dawkes, G., Hart, D., Grant, K. & Swift, D. (2019). *Beyond the Wantsum: archaeological investigations in South Thanet.* Spoilheap Publications.

[9] Sir H. Godwin (1975). The History of the British Flora, 2nd edition, Cambridge, Cambridge University Press.

[10] *Iter Plantarum,* 1629.

(Hanbury & Marshall, 1899). Its decline was probably prompted by improved seed cleaning as it must originally have been harvested with cereals and re-sown as a contaminant of seed corn, but also tracks the general demise of many arable weeds; and by the time of Philp (1982), it was regarded as having been extinct in the county from 1946. This date presumably derives from Francis Rose's specimens at Maidstone Museum from a cornfield south east of Cobham Park (which is probably part of the history of continuity at Ranscombe Farm) and as a rubbish dump casual at Green Street Green; but, although regarding it in his manuscript Flora as extremely rare in Kent (this section was probably written c.1960), he gave later records: from a cornfield at Sandyhurst Lane, Ashford, where frequent in 1947; from a cornfield at Rainham, 1948-49; from a field or fields south east of Stelling Minnis, 1954 and 1958; and from allotments at Willesborough and by railway sidings at Ashford, both in 1955.

The use of the species as a 'wildflower' seed mix constituent (and as a garden plant in its own right) has resulted in its appearance in amenity areas or waste ground, and sightings can be dismissed which are accompanied by species such as *Cota* (*Anthemis*) *austriaca* (Austrian Chamomile) or which are obviously garden escapes. These are excluded from the data table below. The origin of other records cannot be readily assigned, and evidence is required that anything other than a recent introduction is involved.



***Agrostemma githago* Kent records to 2024 mapped at tetrad level, from BSBI database. This does not exclude those of doubtful origin. The consequence is a fairly random scatter across the county, as one might expect of a widely introduced plant.**

The most convincing occurrences of derivation from the buried seed bank are those at West Malling and Ranscombe Farm (see table below). It appears that Corncockle is more responsive to ploughing in autumn than in spring, given that in 2012 it fared better in Longhoes Field at Ranscombe than in Kitchen Field, which respectively received spring and autumn cultivation[11]. Also, it declined there in 2013 when spring cultivation was resumed, due to poor weather in the preceding autumn. In order to maintain a population at Ranscombe which is not susceptible to catastrophic collapse in a poor year, seed is maintained and used for scattering back in its area of origin.

Ranscombe Farm. Photo by Stephen Lemon, 9 June 2012

Flowering starts in June or July, with seed being shed in October and November, upon which germination usually takes place and plants over-winter as rosettes, to re-commence growth in April. At that time some secondary germination may also take place. There have been contradictory data as regards seed viability, ranging from one to two years only, to over 20 years; these differences may reflect the water content of the seeds.[12] Kentish data support the existence of a seed-bank, but not necessarily a consistent one.

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[11] R. Moyse. Letter from Ranscombe Farm, *The Newsletter of the Kent Field Club* (August 2012) **76**:29.

There is another species of *Agrostemma* from the East Mediterranean, *A. gracilis*, which has been found in Kent, albeit that its status was as 'a large relict colony'. This was found by John Palmer near Swanley; he noted it as having the petals shorter than the calyx, whose teeth were the same length as the tube, and with the limb of each petal having lines of black spots.[13]

Records suspected to have been from sown seed or known to have been closely associated with gardens are not included here.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Sevenoaks	TQ55H		16 May 2002	DG & EGP	
Ranscombe Farm	TQ6967, TQ6968 and TQ7167	Owned by Plantlife and Medway Council, and managed with regard to arable weed flora	(1) 29 July 2024 (2) 5 July 2022 (3) 3 July 2022 (4) 28 June 2022 (5) 4 June 2020 (6) 5 July 2015 (7) 2013 (8) 23 June 2012 (9) 9 June 2012 (10) 9 June 2010	(1) LM & LR (2) KBRG/ BSBI meeting (3) (4) (5) RM (6) DS (7) RM (8) CO (9) SL (10) GK & WFS meeting	(1) TQ 714 673. Longhoes Field. (2) TQ7167, In the low hundreds. (Longhoes Field) (3) a few small plants still with flower at TQ 6980 6792, many more in seed. (4) (a) TQ6968, less than fifty. (Kitchen Field). (b) TQ6967, less than one hundred. (Kitchen Field) (5) TQ 715 673 (Longhoes Field) and TQ 697679 (Kitchen Field), in both cases a poor year, with few plants and these often small. (6) TQ 71625 67350, over 40 flowering plants along edge of Longhoes field. (7) Still present in Longhoes Field (TQ7167) and Kitchen Field (TQ6967), but not responding as well to spring cultivation as autumn. (8) Less than five plants at edge of Kitchen Field. (9) In flower in Longhoes Field close to edge and to the road, at c. TQ 715 673. (10) Scattered on west side of field, TQ716673. Kitchen Field and its past records also fall within TQ6968. JP accounts for the species as having arrived in the north-facing field after deep ploughing in the autumn of 2001, being abundant in strips down the field in 2002, and recorded thereafter by JP until 2010, with numbers varying from year to year). There are, however, records from 2000 at TQ 69758 67971 (JP) and at both TQ6979 and TQ6968 (BW).
Ranscombe Farm	TQ66Y & Z	As above	After 1990, before 2006	EGP (Philp, 2010)	Attributed to deliberately deeper ploughing.
West Malling airfield (now	TQ6854	Developed site	August 1999	FB & EGP	On bank of top-soil, TQ 687 550, and likely to be a product of the

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[12] Firbank, L.G. (1988). *Agrostemma githago* L. (*Lychnis githago* (L.) Scop.), Biological Flora of the British Isles. *Journal of Ecology* **76**: 1232-1246.

[13] Palmer, John R. (1990). A second Corn Cockle in Britain. *BSBI News*: **55**: 33.

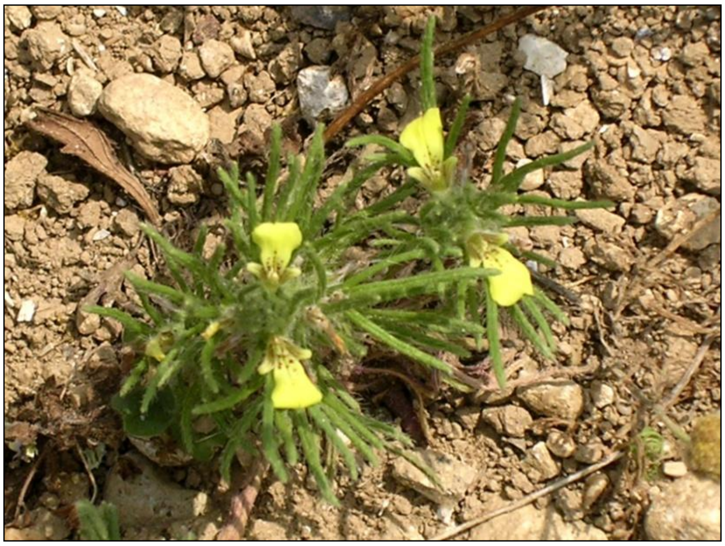
Kingshill).					first soil disturbance here at least since the 1930s, with cultivation not having taken place for over 100 years. *Centaurea cyanus* and *Hyoscyamus niger* also present.
South west of Kingston	TR1850		25 June 2016	SC	TR 1807 5010, one plant, in a generally weedy area by field, a cultivated margin with no other classic cornfield annuals.
Grove Ferry	TR26G		1 August 2003	PH & EGP	
St Nicholas at Court	TR2566		25 June 2017	CO	Two plants in same place on chalk mound edging north side of farm road at TR 2575 6695, just west of St Nicholas at Court Farm, as *Glebionis segetum* plants were in 2016, although these seemed to be gone. Main accompanying flora consists of opportunists of rough ground.

Ajuga chamaepitys (L.) Schreb. (Ground-pine)

vc 15 and 16

Rarity / scarcity status

Ajuga chamaepitys is regarded as **Endangered** in England and in Great Britain as a whole, and it is included as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. It is protected from picking and destruction under Schedule 8 of the Wildlife and Countryside Act 1981 (added in 1992). It is confined to south east England, and the Kent populations are a significant proportion of the national total. It is **scarce** in Great Britain as a whole. Whilst not common in Kent, it falls short of qualifying as locally scarce. It is a Kent axiophyte and so is indicative of good habitat.



Ladd's Farm. Photo by Judith Shorter, August 2003

Account

Ajuga chamaepitys has generally (but not correctly) been regarded as first recorded in Kent by Gerard in 1597[14], where he described it as growing "verie plentifully...especially about Graves end, Cobham, Southfleet, Horton, Dartford and Sutton". Culpeper (*The English Physitian*, 1652) also described it similarly, remarking that it grows more plentifully in Kent than in any other county of this land (as indeed it still does). The chalk in north west Kent has remained its core county territory, although with a scattering of historic records (and a more recent one) in the far east. It was locally common at the end of the 19th century and even when Francis Rose was assembling records for his Flora of Kent in the 1940s and 50s, he considered it to be 'locally frequent in mid-Kent from Dartford and Eynsford in the west to Harrietsham Downs eastward; very rare elsewhere, but with a few outliers in extreme east Kent'. It remains very local, albeit far from common, without significant change between the surveys in Philp (1982) and Philp (2010) – 13 and 11 tetrad occurrences respectively. Nor has there been material change since, with plants recorded in 13 tetrads (16 monads) in the period 2010-22.

Top of Kitchen Field, Ranscombe Farm, habitat. Photo by Lliam Rooney, 24 July 2012

This (usually) annual species favours disturbed or eroding chalky ground, particularly broken ground on steep sunny slopes and banks or arable field margins, and where scuffed by rabbits. Disturbance provides open ground for spring germination and establishment from the seed bank, although some germination appears to take place as early as August / September, at risk from winter frosts. The Kent records involve populations which often vary considerably from year to year, which may reflect the effects of disturbance, or the lack of it as well as the mildness, or otherwise, of winter. Its occurrence on bare, dry, open, south-facing ground points to being a member of England's 'desert flora'[15], in Peter Marren's words, a plant whose core distribution is more southerly, in central and southern Europe.

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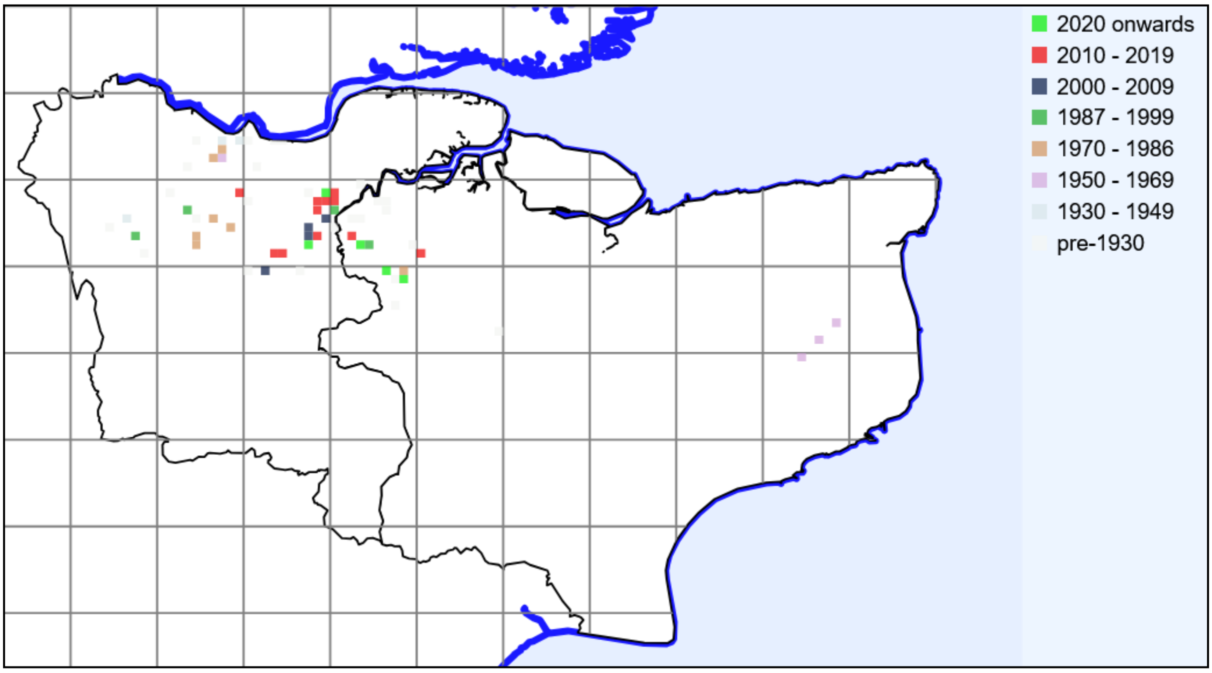
[14] However, there are two earlier mentions of this species in Kent. The first is by William Turner in *The thirde parte of Vuilliam Turner's Herball* (1568), 'in good plenty in Kent', noted in David Pearman's *The Discovery of the Native Flora of Britain and Ireland* (2017). The second is a note entered in a copy of Lyte's *Herbal* (1578) belonging to the Radcliffe Trustees in Oxford. This refers to 'Ground pyne' – 'luxuriat in Cantio' (cited in Gunther, R.T. (1922), *British Botanists and their gardens*).

Marren assigns its present-day rarity to several reasons: intensification of arable farming, including the use of herbicides and nitrate fertilisers and ploughing of headlands and fallow; the decline of rabbits from 1954; the abandonment of fallow field farming on the North Downs and the development of scrub and woodland instead; and the destruction of chalk downland habitat. This seems a fair assessment. Francis Rose regarded it as a plant of bare, broken stony ground on the downs, and cornfields on chalk. The 1940s/50s records which he assembled included 11 references to downs or chalk turf and 12 to cornfields. It is the cornfield habitats which we have lost especially, doubtless for the reasons mentioned earlier.



***Ajuga chamaepitys* (Ground-pine) Kent records to 2024 mapped at monad level, from BSBI database**

Its Kent distribution is shown in the accompanying map, currently clustered mostly round the Lower Medway valley. As this map is of records at monad level, it is not fully representative of pre-2010 records, which were usually made at tetrad level or even vaguer resolution.

It is not readily confused with any other British species but resembles a diminutive pine seedling (hence 'Ground-pine') because of its small size) and because of that small size may be difficult to spot amongst other plants, although it is generally in barer places.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Oxenden Wood Road, Chelsfield (metropolitan vc16)	TQ4763	Private garden	1988	EI & EH	TQ470636, one-off occurrence of single plant on root-plate of beech uprooted by 1987 storm.
Eynsford	TQ5462		1 July 1972	RMB	TQ 546 627, Upper Austin Lodge, on a steep chalk slope recently disturbed by laying a gas main.
Farningham – West	TQ5665		24 June 1972	RMB	TQ 566 655, bank of Scratchers Lane, then recently realigned as

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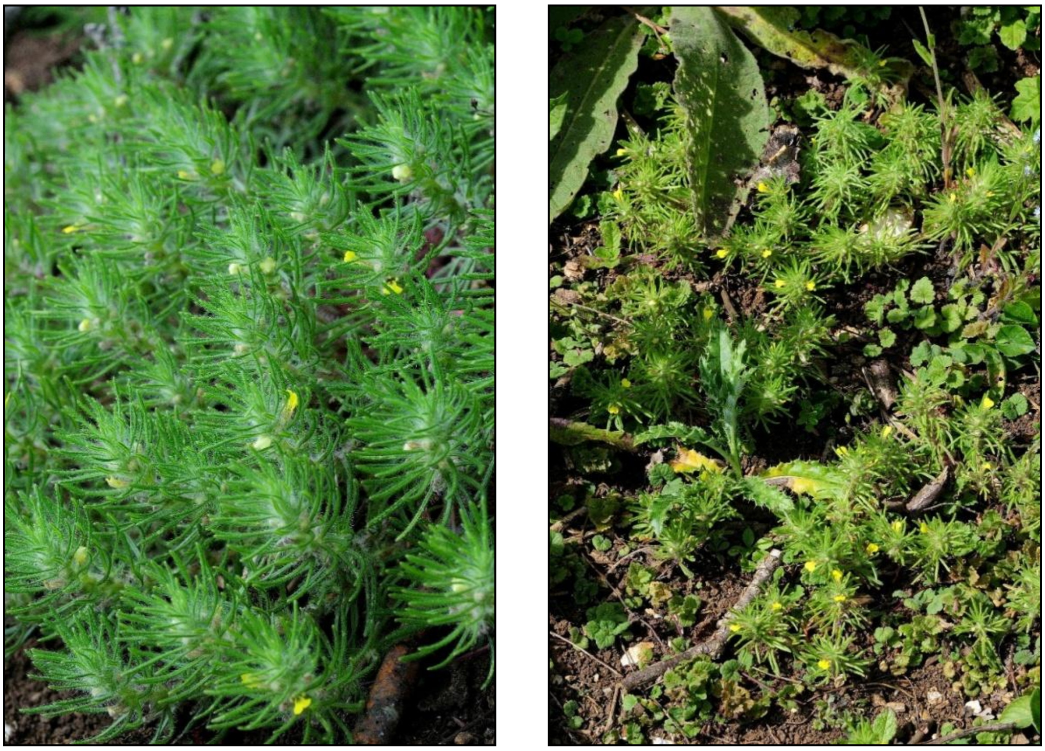
[15] Marren, P. (n.d.) The status of Ground Pine *Ajuga chamaepitys* (L.) Shreb. [sic] in England. *Plant Life 'Back from the Brink' project report* [re work 1993-94].

Kingsdown					part of M25 construction. Searched for unsuccessfully since.
Darenth Wood	TQ5773		1977	JRP	Field to the west of the wood. A number of different locations (relating also to TQ5772 and TQ5672) appear to have been involved in earlier records.
Fawkham, Church Wood	TQ5968	Private house amenity land.	21 July 2010	JS	Many records from 1985 to 2002 for TQ 596 683, by RMB, JRP and others.
Trottiscliffe escarpment	TQ6259		2002	Anon.	40-50 plants at TQ 624 599. There are some previous records, as far back as 1875 but especially in the 1990s, when a chalk scar and new fence line were involved. Population generally between 40 and 200 plants.
Trosley Country Park	TQ6361, TQ6461	SSSI managed by Kent C.C.	(1) 29 June 2018 (2) 29 September 2011 (3) 13 Aug 2010 (4) 28 July 2010	(1) KBRG meeting (2) RR (3) SB (4) L&DH	(1) (a) Trosley Country Park, five plants on the usual steep slope from TQ 6478 6127 to TQ 6473 6123. (b) Trosley Country Park, One plant seen in Little Pell at TQ 63779 61087. Currently goat grazed (2) 29 plants at TQ 638 611. (3) On steep chalk slope, one plant at TQ 63776 61093 and five at TQ 63779 61088. (4) Three plants at TQ 63741 61147. c. 40 plants at TQ 64791 61263 and c.20 at TQ 64791 61270
Halling - Trottiscliffe escarpment	TQ6762	SSSI, at least in part.	(1) 1 July 2024 (2) 24 July 2013 (3) 19 June 2012 (4) 18 June 1988	(1) LM & LR (2) CS (3) LM (4) NCC England Field Unit	(1) TQ 67654 62531, TQ 67707 62542, TQ 67704 62538, TQ 67690 62541, TQ 67718 62537, TQ 67713 62541, TQ 67650 62530, TQ 67586 62523. Holborough Woods, Lad's Farm Field. (2) 56 plants found during course of arable plant survey, along north margin of field below downs, TQ 673 622. (3) A detailed survey with 10 figure grid references, partly assessed in terms of patches, partly as clumps or individual plants: in summary, the species was widespread in a field designated no. 2 of Ladd's Farm, generally in open areas but also under scrub and extending into woodland edge, the estimated total being over 1,000 plants. The field extended into TQ 674 624, TQ 674 625, TQ 675 624, TQ 675 625, TQ 676 624, TQ 676 625, and TQ 677 625. (4) TQ 675 626.
Halling - Trottiscliffe escarpment - Upper Halling	TQ6764		29 June 2005	JP	TQ 676 643, large spread along cleared bank above a track, as well as in the track. Well over 600 plants.
Halling - Trottiscliffe escarpment - Lad's (or Ladd's) Farm	TQ6763, TQ6863 and TQ6866	Part SSSI	(1) 26 July 2013 (2) 11 July and 27 June 2012 (3) 19 June 2012 (4) 28 July 2010	(1) CS (2) & (3) LM (4) JS	There are many records by various recorders from 1979 onwards, particularly for a field edge in the Mount Ephraim area. References given are TQ 678 634, TQ 680 636, TQ 684 638, TQ 688 632. Plant numbers vary from 120 (2002) to over 400 (1997). 2010 record is for TQ 684 636. 11 July and 27 June 2012 records are for 280 plants at TQ 683 637, TQ 682 387 and TQ

					682 638 (fuller references given). 19 June 2012 record is for 20 plants at TQ 680 663 (fuller references given). 2013 record is for TQ 682 636, 43 plants between track on first row of wheat along top margin of field. This area may correspond to E.S. Marshall's find in fallow on the chalk near Halling on 25 May 1893 (specimen in **BM**).
Cuxton Warren	TQ6965	SSSI	2002	Anon.	TQ 698 655: there have been records from 1991 (JP and others) onwards, ranging (where mentioned) up to 66 plants (1998). This may be Halling Warren, where found by FR in 1947.
Ranscombe Farm	TQ6967, TQ6968 & TQ7067	Owned by Plantlife and Medway Council, and managed with regard to arable weed flora	(1) 15 July 2020 (2) 5 August 2014 (3) January 2014 (4) 2013 (5)3 July 2010	(1), (2) & (3) RM (4) Plantlife (5) DMa	(1) TQ 697 681, just one plant. (2) TQ 693 677, Brockles Field. (3) In Kitchen Field at TQ 698 680, disturbed grassland edge east of path, 19 and 12 plants; 8 more west of path, at TQ 697 681. (4) The Plantlife count for 2013 (per RM) is 51 plants in Kitchen Field between c. TQ 6977 6811 and TQ 6990 6799. This is an increase from 13 in August 2012 and 3 in 2010. (5) In Kitchen Field at c. TQ 697 681 (where there have been many records by various recorders from 1985 onwards); and at field edge from TQ 697 679 to corner at TQ 698 680, then to TQ 697 681. It has been known here at least since 1827 (specimen in Liverpool Museum).
Wouldham Common	TQ7263	Part SSSI	(1) 4 June 2007 (2) Many records from 1992 to 2002	(1) J&BH and others (2) SW & PPM	(1) Six plants on bare ground, chalk grassland at woodland edge, TQ 72337 63465; 20 plants on trackway between two areas of chalk grassland, TQ 72637 63235. (2) Records at TQ 727632 have ranged from four plants (Anon, 2002) to over 1000 (1992). The earlier high numbers may be attributable to use as an access point for timber extraction after the 1987 storm with consequent disturbance opening up the seedbank.
Burham Down	TQ7362	Part KWT managed reserve, part SSSI	(1) 13 May 2024 (2) 27 September 2023 (2) 5 June 2023 (3) 12 September 2022 (4) 19 May 2022 (5) 12 July 2021 (6) 24 May 2010 (7) Many records from 1995 to 2002	(1) –(4) DCh & ME (5) DM (6)KBRG meeting (7) SP & DG (8) DS	(1) TQ 738 622, north end of field to the east of the track up from the village, 26 plants, all small but many with flowers. (2) TQ 737 622, on track at N end of field E of public footpath up downs, not on KWT reserve, 16 small plants including 3 still with flower, 10 very small seedling plants, evidence of spread eastwards since June sighting. (3) TQ 738 622, four small plants, somewhat crushed on a track at the top of the field. (4) TQ 738 622, several plants, some with flowers still out, not on the reserve but at the north end of a field that has not had crops for several years. (5) (a) TQ 73830 62145 to TQ 73874 62125, 117 plants, plus 16

					more at TQ 7387 6211. Most were quite small, but a few were about 14 cm x 10cm. Same site as 12 July 2021 record. (b) Rough field above pit, 16 plants at TQ 7387 6211, and 117 plants from TQ 73830 62145 to TQ 73874 62125. (6) A total of 23 plants counted at the margin of a rectangular field on shallow soil over chalk from TQ 73852 62137 to TQ 73879 62126. (7) c. 35 plants, all growing along top of chalky field, TQ 7385 6221. (8) TQ 735 623: records have ranged from one plant (1995) to 11 (1999), or described as a thriving clump 0.5m wide, 1.5m down a bank, plus a second colony. Not seen in 1994, although known before then.
Detling-Wouldham scarp	TQ7462	SSSI	29 June 1988	NCC England Field Unit	TQ 740 621.
Boxley Warren	TQ7659	SSSI	(1) 29 June 2020 (2) 26 June 2010, 9 July 2011	(1) GK (2) LM	Recorded at Boxley as far back as 1848. (1) TQ 76724 59830, plants in at least four patches on south east-facing chalk downland slope, on bare chalk where rabbited. (2) The 2010 record was with a Kent Field Club meeting; plants appeared to have increased in 2011, present in quite large amounts over the disturbed steep slopes, TQ 767 598.
Detling, The Larches	TQ7858, TQ7958	SSSI managed by KWT	(1) 27 May 2021 (2) 7 August 2010 (3) 4 July 2009 (4) 26 July 2005	(1) DM (2) JS (3) RM (4) BW	(1) The Larches, TQ 78946 58875 (2) c. TQ 781 595. (3) TQ 788 589. (4) TQ7958. There are also records from 1986 to 1999, with the most specific location being TQ 788 589, reported numbers varying from 88 to 163 plants.
Bredhurst Hurst Woods	TQ8061		8 May 2011	KFC meeting, per SP & DG	Five plants in scrub cleared area, TQ 80454 61744.
Queendown Warrren	TQ8263	KWT managed reserve	8 June 2004	JS	TQ 829 630.
Various	TQ56Z, 66F, 66K, 66R, 66S, 66X, 66Z, 76G, 75U, 75Z, TR25W.		After 1990, before 2006	EGP (Philp, 2010).	Some of these locations are likely to be represented by the sites described above.



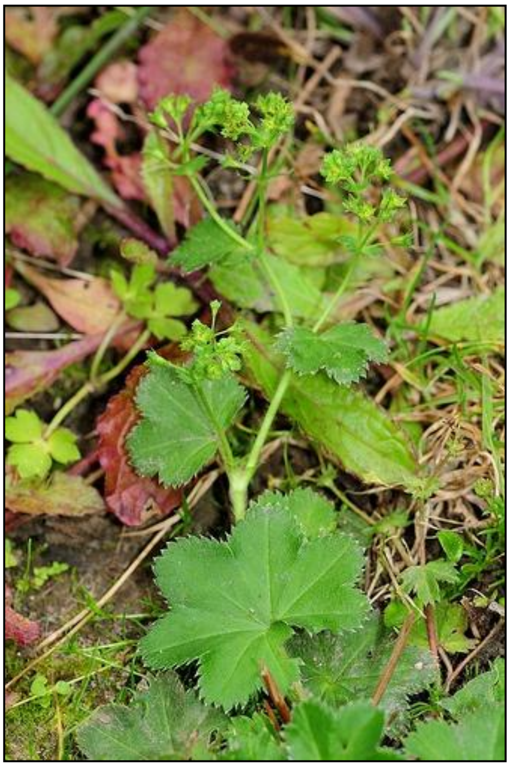
Ladd’s Farm. Photo by Lliam Rooney, 29 June 2013

Alchemilla filicaulis subsp. *vestita* Buser (M.E. Bradshaw) (Common or Hairy Lady's-mantle)

vc 16; gone from vc 15

Rarity / scarcity status

In the British Isles, *Alchemilla filicaulis* subsp. *vestita* is the commonest and most widespread Lady's-mantle, and any threat for England and for Great Britain as a whole is regarded as of 'Least Concern'. In Kent (and to a degree, East Anglia), however, the position is very different. It has only been reported in recent years as barely hanging on in Kent and so the plant is locally **rare**.



Broad Oak Wood. Photo by Lliam Rooney, 15 July 2011

Account

John Parkinson wrote in *Theatrum Botanicum* (1640) of Alchymilla major vulgaris as growing in many pastures and woodsides, such as in Kingwood near Faversham (= King's Wood, Challock?); and there are subsequent historic records in both vc 15 and 16. Many Lady's-mantle species and subspecies have historically been lumped together as *Alchemilla vulgaris*, and it is under this name that Hanbury & Marshall (1899) summarised the then known Kentish records, when it was regarded as rare.

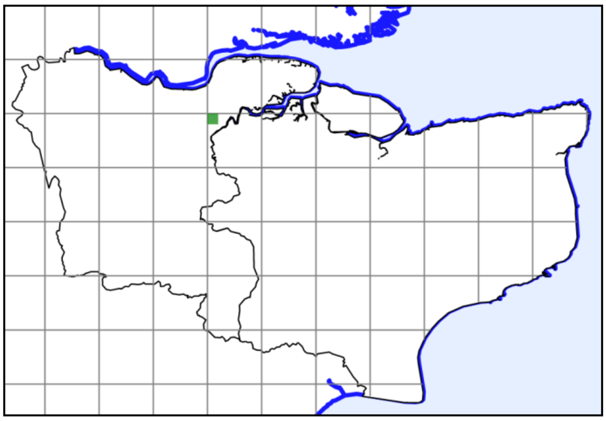
Philp (1982) refers to *Alchemilla filicaulis* subsp. *vestita* as at Oaken Wood, Barming (TQ75C) and Great Wood, Cobham (TQ76E).

The former site had records going at least back into the 1880s for the Lady's-mantle at the roadside near North Pole Farm, which could not be found in the course of the survey published as Philp (2010).

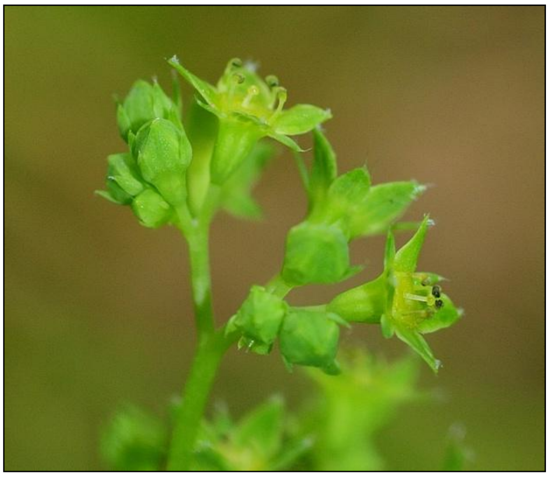
At the Cobham site, it was recorded as just hanging on in the middle of a woodland ride (Philp, 2010 and Eric Philp, personal communication), and on 15 July 2011 was re-found by Lliam Rooney at TQ 70619 68853 in Broad Oak Wood. Twenty plants were discovered in a damp area of what used to be a woodland ride – an old coppice track dating back at least a century and shown on the Ordnance Survey, but not readily accessible from the main path. The main patch comprised 16 plants in an area of about 4 x 2 metres; together with a secondary patch about 4 metres away in an area of about 2.5 x 3 metres. Associates were *Ajuga reptans, Centaurium erythraea*, *Fragaria vesca*, *Hypericum perforatum*, *Lysimachia nemorum*, *Primula vulgaris, Prunella vulgaris*, *Ranunculus repens*, *Rubus fruticosus* agg. and *Sagina procumbens*. The population does not appear susceptible to being scrubbed over, but could without conservation measures be affected by bramble spread.

Later in 2011 the plants were counted at 24 by Richard Moyse, in spite of what appeared to have been a recent loss of some plants. They are within an area managed by Plantlife, together with Ranscombe Farm. A KFC meeting on 16 June 2012 located at least four plants present along the wet areas of the ride, recorded as between TQ 70626 68789 and TQ 70651 68666. The Ranscombe Farm count in early August 2013 noted 69 individuals, so there appears then to have been an increase since 2011, but not necessarily evenly across each year. On the other hand, the total as at August 2014 was 20 plants, ten in May 2016, 14 in August 2021, eight in September 2022. Richard Moyse has noted that peak counts tend to be spring and late summer, presumably as a result of germination at these times, with a substantial drop in the number of vegetative individuals in July. Although *Alchemilla* is a genus of perennials, it appears that the species in Kent shows quite a high turnover of individual plants. It was still present in August 2023, at TQ 706 687 and TQ 706 688.

Favouring basic or neutral soils, this grassland plant has become restricted in the county to a woodland marginal habitat; it has gone from Kent unimproved pasture locations.



Alchemilla filicaulis **Kent records as at 2023 mapped at tetrad level, from BSBI database**



Broad Oak Wood. Photo by Lliam Rooney, 15 July 2011

Habitat, Broad Oak Wood. Photo by Stephen Lemon, 16 June 2012

Alchemilla xanthochlora Rothm. (Intermediate or Pale Lady’s-mantle)

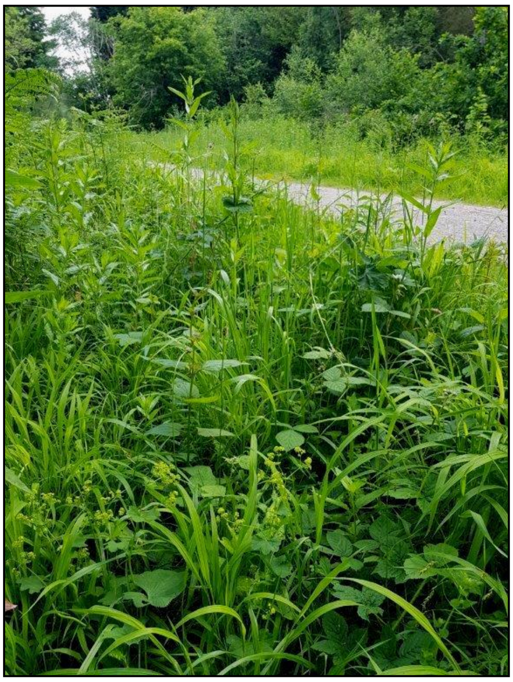
vc 15

Rarity / scarcity status

Alchemilla xanthochlora is widespread in northern Britain, Wales and north Ireland, but almost totally absent from south east England. Any threat to its status in England and for Great Britain as a whole is regarded as of ‘Least Concern’. In Kent, it is very **rare**.

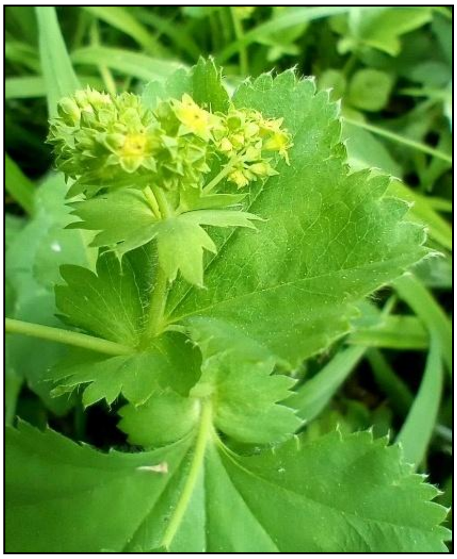
Account

There are no Kent records before 1976 and this, together with its national distribution, suggests the possibility that it has been introduced into Kent. It is nonetheless being afforded rare plant register status, since its origins here are a matter of surmise and there is merit in gathering relevant data to inform an understanding of its standing in the county. There are historic Lady’s-mantle records in various parts of Kent, summarised by Hanbury & Marshall (1899), but as they were treated under the umbrella name of *Alchemilla vulgaris*, it is not possible to be sure whether or not any of these represented *A. xanthochlora*, other than in relation to a Teston specimen which Hanbury & Marshall attributed to *Alchemilla filicaulis* (Common Lady's mantle).



Habitat, Park Wood. Photo by John Buckingham, 9 June 2024

The first Kent record is mentioned in Philp (1982) as a single patch in Park Wood, Lyminge Forest found by ‘R. Goorer’. This was presumably Richard Gorer, a knowledgeable horticultural writer well capable of recognising that such a discovery, made in 1976, was likely to have been unusual; he had it identified by Max Walters, then director of Cambridge University Botanic Garden. Philp (2010) corrects the finder’s name and says that repeated searches have failed to re-find it. It remained undetected until 6 June 2024, when Ade Jupp came across two patches, 133m apart. One was at TR 14896 44985, about 2m off the side of a forestry track in Park Wood and the other was in the next monad north at TR 14971 45095. Associated species noted on 9 June comprised *Brachypodium sylvaticum* (False-brome), *Rubus fruticosus* agg (Bramble), *Carex sylvatica* (Wood-sedge), *Lotus pedunculatus* (Greater Bird's-foot-trefoil) and *Potentilla anserina* (Silverweed) in dampish terrain backed by a bank with *Pteridium aquilinum* (Bracken), *Epilobium hirsutum* (Great Willowherb) and *Corylus avellana* (Hazel). The ability to grow in damp areas with relatively tall vegetation is a characteristic of *Alchemilla xanthochlora*



Park Wood. Photo by Ade Jupp, 6 June 2024.

Their elusiveness of these plants may be explained by visits being made either too early in the season when flowers would not be present to catch attention, or too late, by which time the small plants would easily disappear under a mass of trackside vegetation. The present record, on 6 June, is very much the same time of season as the historic record, on 13 June 1976.

Philp (2010) considered that the species was probably introduced in Kent by forestry work. This conjecture would be supportable by its extremely local occurrence, the absence of any other current records nearer than Osfordshire, and its Lyminge presence in planted forest of *Pinus sylvestris* (Scots Pine) and *Pseudotsuga menziesii* (Douglas Fir). There is nothing in the character of the seeds which suggests suitability for long-distance natural dispersal, although it is a widespread European species.

Nonetheless, there remains a possibility that its Kent status is as a long-undetected native. Park Wood has been woodland with rides at least back to the earliest published large-scale Ordnance Survey maps, and the Natural England designation is ancient replanted woodland, which gives some scope for long floral continuity in the rides (although there is a historical account of Lyminge Forest which says that the rides were choked with coppice to 1949). If we go back further, Hasted (1799) in describing Stowting parish says 'Above the hill is Stowting common, and a little further Limridge green; round both which are hamlets of houses. In this part the hills are very sharp and frequent, the soil barren and very flinty, consisting either of chalk, or a poor reddish earth, mixed with quantities of flint stones; and here there is much rough ground and poor coppice wood, and a very comfortless dreary country, which continues for several miles northwards, on each side *the Stone-street way*, towards Canterbury'. So this gives scope, both for introduction with tree planting/forestry management, or for native survival on woodland rides or margins.

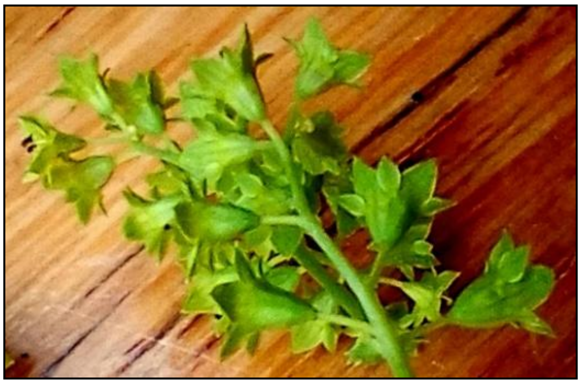


Photo by Ade Jupp, 6 June 2024

Alchemilla xanthochlora, as is usual with *Alchemilla,* is an apomict, hence not requiring fertilisation by pollen in order to produce seed. Apomixis has resulted in the perpetuation of clones differing in minor characteristics which can be treated as species or microspecies, and *A. xanthochlora* may be distinguished from other British *Alchemilla* taxa by the combination of leaves glabrous above and hairy below, shallowly toothed, petioles/stems with patent or ascending hairs (not deflexed), flowers small and pale yellow.

Allium oleraceum L. (Field Garlic)

vc 15 and 16

Rarity / scarcity status

Allium oleraceum is regarded as **Vulnerable** to the risk of extinction in Great Britain, although no special risk exists for England. In Kent, however, it is **rare** and its presence here is as an outlier of the national distribution, which is primarily from the south west, into the Midlands, and north to Yorkshire and Cumberland.

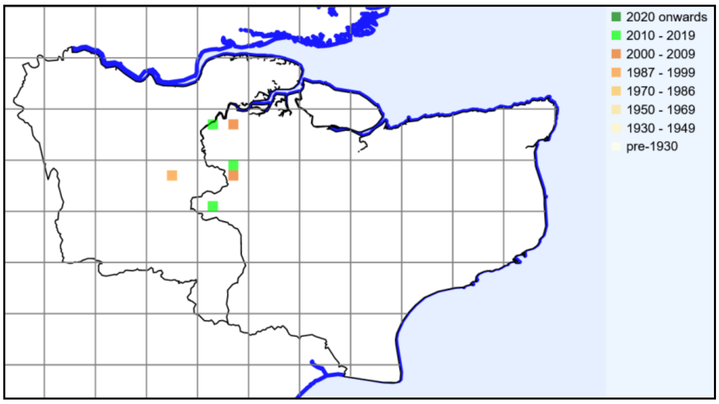
Account

The first Kentish record appears in the second edition of William Hudson's *Flora Anglica* (1778), in which he refers to *Allium carinatum* (to which name some plants of *A. oleraceum* were then referred, although this is properly a separate, introduced species) as near Ramsgate and between Sandwich and Deal. Hanbury & Marshall (1899) recognised it as chiefly from coastal habitats, such as banks, but rather rare.

It has continued to be rather rare in Kent; and although nationally it is treated as a native of dry, often calcareous, grasslands or (contrastingly) of river or floodplain banks, in our county it generally occupies marginal habitats – by footpaths or on roadside verges.

Borstal. Photos by Lliam Rooney, 29 June 2011

Our Borstal record is of interest in view of the reference in Turner and Dillwyn's *The Botanist's Guide to England and Wales* (1805) to its presence in lanes near Rochester. It was also known to Francis Rose in a hedge-bank south of Borstal in 1946, but was thought to have been destroyed by motorway works in 1963; the present site is a little further south.



***Allium oleraceum* Kent records as at 2024 mapped at tetrad level, from BSBI database**

Allium oleraceum can spread by seed (pollination may often be by wasps), but in Britain spread is primarily via bulbils and by subterranean bulbs[16]. It may be distinguished from *Allium vineale* (Wild Onion) through its spathe having two persistent valves (*A. vineale* has one, which may drop early). In Britain, there are two varieties: var. *oleraceum* (leaves 2-3mm wide, semi-rounded, and usually hollow at least below); and var. *complanatum* (leaves 3-4mm wide, flat). Recording to varietal level does not appear to have been undertaken in Kent.

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[16] Stroh, P.A. (2014). *Allium oleraceum* L.. Field Garlic. Species Account. Botanical Society of Britain and Ireland.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Offham	TQ65N		After 1990, before 2006	EGP (Philp, 2010)	On the north side of Comp Lane, around TQ 654 571. [Recorded further east along Comp Lane, as TQ 642 570(5), by FR in 1963.]
Maidstone	TQ75T		After 1990, before 2006	EGP (Philp, 2010)	TQ 764 579, in rough grassland at edge of Sandling Lane near Penenden Heath, where present at least since 1958. It may have been affected by development since.
Borstal, Burham Road	TQ7266		(1) 29 June 2011 (2) 30 June 2010	(1) LR (2) SP & DG	TQ72574 66100. (1) See photographs. (2) A patch c. 3m x 1m (by white marking on road).
South of Coxheath	TQ7350		26 October 2017	BW	Road verge.
Chatham, Daisy and Coney Banks	TQ7666		12 June 2005	JP	A large colony in cut scrub.
Boxley	TQ7758		21 July 2017	BW	Edge of overflow churchyard.

Alopecurus aequalis Sobol. (Orange Foxtail)

vc 15 and 16

Rarity / scarcity status

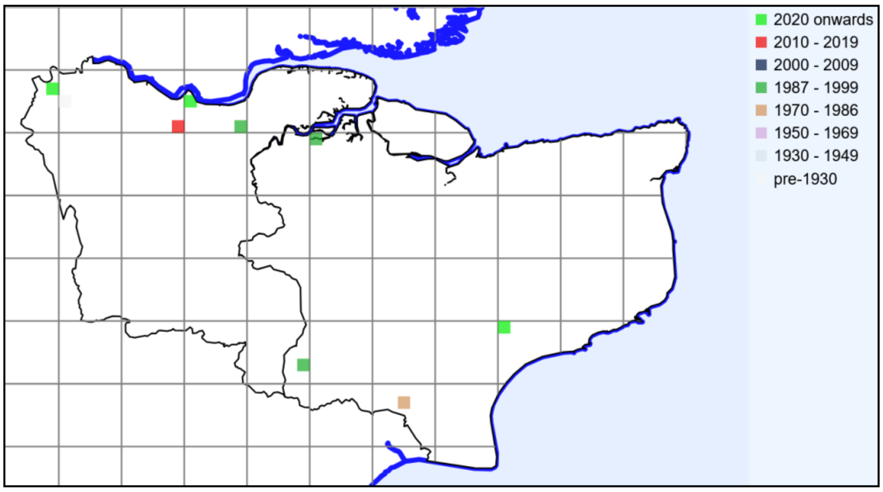
Nationally *Alopecurus aequalis* is fairly well distributed across the Midlands and South East; and other than, perhaps, in the longer term it is not regarded as being particularly threatened (the threat status being of 'Least Concern'). Losses from old habitats may have some counterbalance from its readiness to colonise new ones. In Kent, however, it is **scarce** and sightings are irregular. It is a Kent axiophyte and so is indicative of good habitat.

Beacon Hill Country Park, Bean. Photo by Geoffrey Kitchener, 9 August 2011

Account

This grass may be passed over for *Alopecurus geniculatus* (Marsh Foxtail) and was not recognised in Kent until published in *The Phytologist* (1856)[17] by H.A. Stowell as from near Faversham at some time between 1839 and then. Hanbury & Marshall (1899) treated it as rare. Its county status has not changed a great deal, although its locations have changed; and records have increased between the publication of Eric Philp's two Atlases (Philp, 1982 and Philp, 2010). Only six locations have been the subject of records 2010-24.

***Alopecurus aequalis* Kent records as at 2024 mapped at tetrad level, from BSBI database**



Populations fluctuate considerably as the grass is an annual normally occurring on the margins or floor of shallow freshwater ponds and ditches as the water level recedes, and so its frequency is dependent on the timing and extent of the exposure of drying mud. Sometimes the habitat is a field edge, rather than a pond, and it may be that the water regime there replicates the pond margin habitat, although it does behave as a winter annual weed of cereal crops in various parts of the world, which suggests a breadth of tolerance for conditions. The substrate in Kent appears generally to be neutral or somewhat acid, although studies indicate that seed is capable of germinating over a wide range of pH and most successfully in somewhat basic conditions[18]. The grass is supposed to be fairly tolerant of salt stress, and has been found in mildly brackish conditions on grazing marshes of the Swanscombe peninsula.

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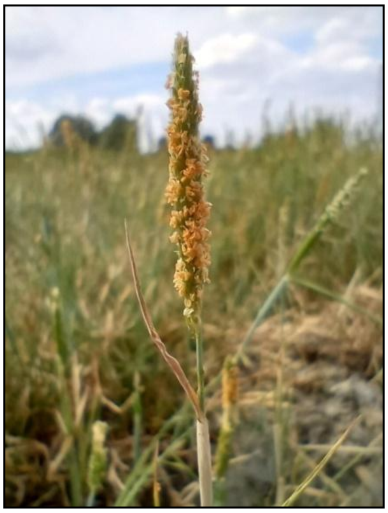
[17] Some Observations on the Flora of Faversham and its Neighbourhood. *The Phytologist* (1856) N.S. i, at p255. Hanbury and Marshall's reference to a first record in 1858 appears pre-empted by this.

[18] Zhao, N., Li, Q., Guo, W., Zhang, L., Ge, L. and Wang, J. (2018). Effect of Environmental Factors on Germination and Emergence of Shortawn Foxtail (*Alopecurus aequalis*). *Weed Science* **66**: 47-56.

The species occupies similar habitats to those of *Alopecurus geniculatus,* but may be distinguished by having very short-awned lemmas, scarcely emerging from the glumes (those of *A. geniculatus* extend for 2-3mm beyond the glumes); and by having bright orange anthers (yellow or purplish in *A. geniculatus*).



Botany Marshes, Swanscombe.
Photo by Geoffrey Kitchener, 13 July 2022

Gibbin's Brook habitat. Photo by Sue Buckingham, 6August 2024

Botany Marshes, Swanscombe. Photo by Geoffrey Kitchener, 13 July 2022

Site	Grid reference	Site status	Last record date	Recorder	Comments
Blackheath (metropolitan vc16)	TQ3976		(1) 20 June 2021 (2) 2 July 2012	(1) PR (2) JC	(1) TQ 3907 7648. Whitfield's Pond, Blackheath. (2) East of Folly Pond.
Bean, Beacon Wood country park	TQ5871to TQ5971	KCC managed country park	9 August 2011	GK	TQ 5896 7161 to TQ 5900 7158. Scattered on dried mud of pond on clay, in places abundant. Also recorded here by GK in July 2005.
Botany Marshes, Swanscombe	TQ6075	SSSI	13 July 2022	GK	TQ 60774 75250, abundant in 15m x 10m area of dried-out but seasonally flooded depression on clay in grazing marshes, cattle-tramped and probably mildly brackish, accompanied by *Plantago major* subsp. *intermedia*; the summer had been hot and dry.
Shorne country park	TQ6870 and TQ6770	KCC managed country park	(1) 20 July 2009 (2) 6 August 2006 (3) 5 August 2006 (4) 26 July 1999 (5) 7 July 1991	(1) LM & JP (2) DM (3) RM (4) RM (5) EGP	(1) TQ 67867 70196, Randall's Bottom Pond. [Not seen 2024, LM, area overgrown.] (2) TQ 6817 7006 (3) TQ6870. (4) Abundant in dried up pond. 683702 and TQ678703. (5) TQ67V.
Goudhurst	TQ73I		After 1990, before 2006	EGP (Philp, 2010)	Field margin
Little Nineveh	TQ73W		28 August 1988	EGP	Cornfield edge. Specimen in MNE.
Riverside country park	TQ86E	Medway Council managed country park	After 1990, before 2006	EGP (Philp, 2010)	
Gibbin's Brook	TR1138	SSSI	(1) 26 June 2024 (2) 17 July 2011	(1) AG (2) BW at KFC	(1) seven plants around a drying pond margin at TR 11637 38627

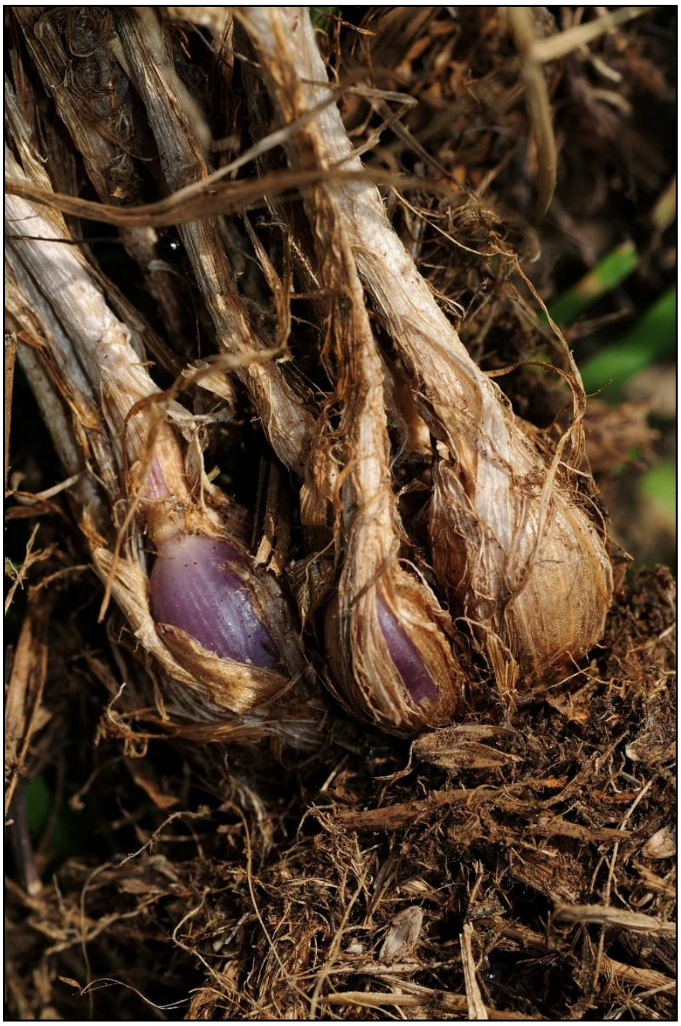
				meeting	and 54 plants in a former drainage ditch where sediment had been spread from pond deepening works in autumn/winter 2023, following clearance of over-shading willow scrub in winter 2022-23. (2) Few plants on edge of small pond near gate, TR 11638 38627.
Rother Levels	TQ92N		June 1978	LBB	Knock Farm, Stoke-cum-Ebony; specimen in **MNE**.

Alopecurus bulbosus Gouan (Bulbous Foxtail)

vc 15 and 16

Rarity / scarcity status

Although in England and in Great Britain as a whole *Alopecurus bulbosus* is not considered to be particularly threatened (its status being of 'Least Concern'), it is both nationally and locally **scarce**, and the Kent populations are somewhat detached from the concentrations of distribution along the south coast of England, south Wales and along the Severn estuary. It is a Kent axiophyte, an indicator of good habitat.



Seasalter. Photo by Lliam Rooney, 2011

Account:

In his *Specimen Botanicum* (1746), John Blackstone provides the first Kentish reference to what he called the Knotty rooted Mousetail Grass, a find attributed to Dr. Wilmer as being "In the first Field next the Road before you go into Northfleet". Hanbury & Marshall (1899) surprisingly refer to this as Southfleet, which is not apt, as the few historic Kentish occurrences have always been along the Thames estuary, in brackish coastal grazing marshes.

In Hanbury and Marshall's time, this grass was regarded as being rare in the county and, except for Sheppey, confined to West Kent. It has, however, since been found in East Kent, in grazing marsh fields at Seasalter; also at Upchurch and Conyer. There is always a question as regards how far its apparent rarity results from being overlooked (easily done, as Marshall commented in the *Victoria History of the County of Kent*, 1908).

In 1987, Kent sites were surveyed, the results being published in FitzGerald (1989)[19]. The species was then found in three sites at Higham Marshes (possibly previously recorded in 1890); inland at Higham (recorded in 1938); at Cooling Marshes (recorded in 1892); at Isle of Harty in Sheppey (recorded before 1840); and at Seasalter (known from 1965 to 1978). It could not be found south east of Frindsbury, where seen from 1944 to 1960. So there is some evidence of continuity, and a somewhat fuller picture than that which was afforded by the county 1971-80 survey published in Philp (1982), when only one tetrad record was made, at Seasalter. This last location contains widespread populations, and diligent recording by Eric Philp (published in Philp, 2010) with repeated visits resulted in subsequent recognition of this plant in five tetrads of grazing marshes there.

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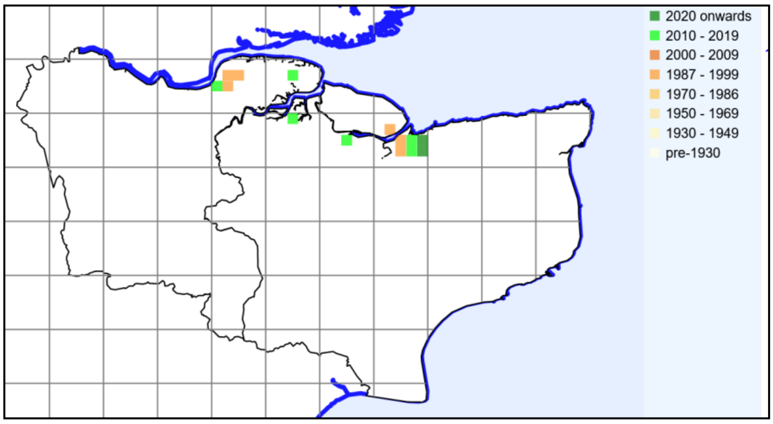
[19] R. FitzGerald (1989). 'Lost and Found' – *Alopecurus bulbosus* Gouan in S.E. England. *Watsonia* 17: 425-428.

Our 2010-24 records amount to eight tetrads (nine monads); the increase over the total of six tetrads given by Philp (2010) is unlikely to reflect any increase on the ground, but is probably an artefact of recording. The accompanying distribution map shows that 2010-24 included some locations without earlier records, but that previous findings in the Higham Marshes and Seasalter Levels had not all been relocated.

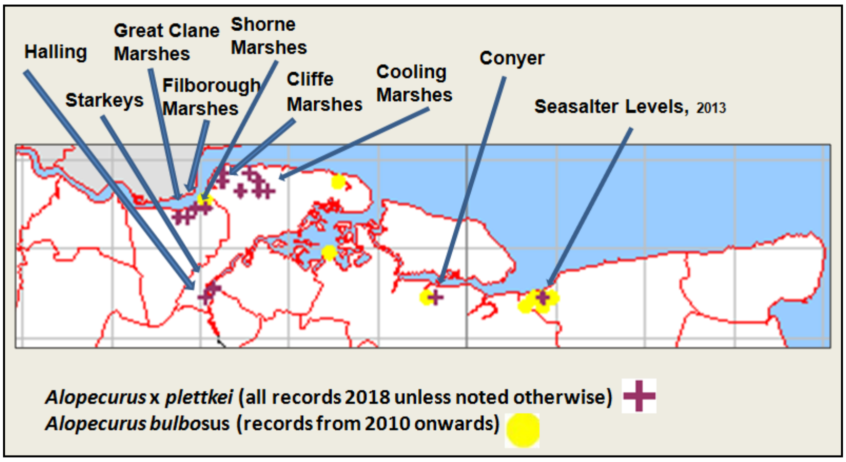
Seasalter. Photo by Lliam Rooney, 2011

Alopecurus bulbosus **Kent records as at 2024 mapped at tetrad level, from BSBI database**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

The position regarding distribution is complicated by the existence of a hybrid with *A. geniculatus* (Marsh Foxtail, *Alopecurus x plettkei*, which may be present in an area in which *A. bulbosus* is also known to be growing, as with 1987 gatherings at Higham and 2013 discoveries at Seasalter; or it may suggest the overlooked presence of *A. bulbosus*; or it may be that the hybrid persists in locations from which *A. bulbosus* has now gone. This last possibility (unless and until *A. bulbosus* is found at the same location) appears to apply to a number of Kent records.

The first such record is a hybrid collection in June 1994 from a grazing field west of the Medway, TQ76C (not 76B, as given in Philp, 2010), near the pylons on Halling Fresh Marsh, (EGP; specimen in **MNE**). It was also seen in this vicinity (TQ 7074 6431) in July 2018 on slightly higher ground above seasonally wet depressions containing *A. geniculatus*. In August to September 2018, however, a search was made for the hybrid across the north Kent grazing marshes, with the result that it was found to be widespread, even in areas where *A. bulbosus* was unrecorded. The distribution is shown below. All sites were near tidal rivers and creeks, where the winding patterns of old drainage runnels are preserved in the landscape, and there may be a degree of brackish influence when seasonally flooded.[20] In 2019 it was also found on Eastchurch Marshes at Sheppey.


Halling
Great Clane Marshes
Shorne Marshes
Filborough Marshes
Starkeys
Cliffe Marshes
Cooling Marshes
Conyer
Seasalter Levels, 2013
Alopecurus x *plettkei* (all records 2018 unless noted otherwise)
Alopecurus bulbosus (records from 2010 onwards)

The cross is in some respects a difficult taxon, since it tends to resemble one or other parent, rather than being simply intermediate. Those plants resembling *A. geniculatus* are perhaps more easily recognized in the field, especially if there are more than 6 nodes per culm and if there are branched stems which are leafier than *A. geniculatus*. The 2018 finds had 7-16 nodes per culm. It is, however, possible to spot hybrid plants without recourse to close analysis, although there is always the need to be cautious of late re-growth of *A. geniculatus*. They, or at least some of them, tend to stand out as being so glaucous as to have almost metallic blue stems and foliage, with straggly stems and small, neat panicles – and they do this from July onwards. This is not a time when botanists are normally looking for *A. bulbosus,* namely at the end of May and beginning of June; the species will have died back in July. The hybrid, as Trist & Wilkinson (1989)[21] point out, dies back by July, to be replaced by fresh growth continuing into September.

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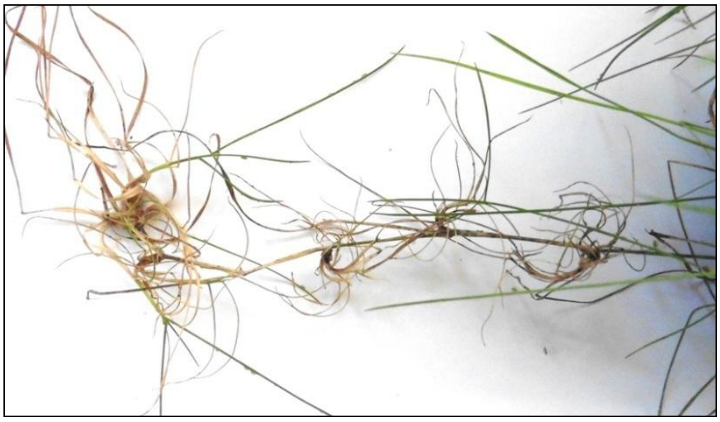
[20] Further details are given in *Kent Botany* 2018.

Alhough *A. bulbosus* and the hybrid would normally be searched for at different times of the year, this does not necessarily explain why they are being found so seldom together. The issue was brought to a focus by a search on 3 June 2019 at Cooling Marshes (RSPB Northward Hill reserve) where the hybrid was seen on 18 September 2018: no *A. bulbosus* was found. The reserve was under arable cultivation before being acquired by the RSPB, so that the grazing marsh grassland is not of long standing. One can infer that hybridisation is no longer taking place in situ, but that the hybrid spreads/maintains itself on its own account. This may largely be by rooting at the nodes, although there is also potential for fragments to be broken off, e.g. by cattle, and to be spread by winter flooding. Winter flooding may be responsible for the presence of the hybrid in view of the site history. It may be that the hybrid survived the period of arable farming in corners or at ditch margins and then spread out when conditions became more favourable with the RSPB takeover; the actual hybridization event(s) could long have preceded this. The impression one has from earlier studies/records of British *A. bulbosus* is that, although the species is nationally scarce, its hybrid is very much scarcer, albeit existing in large populations in some places. In Kent, however, it looks as though the hybrid is more frequent than its *A. bulbosus* parent and is likely to have a level of adaptability which enables it to survive through events (e.g. cessation of grazing or conversion to arable) which *A. bulbosus* does not.

Bulbous Foxtail favours depressions where water may lie in winter, and cattle-trampled areas, often growing with *A. geniculatus* in unimproved grazing marshes. Exclusion of grazing has been noted as reducing the frequency of *A. bulbosus* in French grassland reclaimed from saltmarsh[22]; and this is likely to be the same with us, judging from its growth on semi-open disturbed ground, including perched on clay humps produced by cattle-trampling of seasonally wet terrain. The species does not grow in saltmarsh conditions, and excessive salinity may stunt its growth. It is said to spread by seed and occasionally, but not habitually, by dispersal of the 'bulbs'[23]. However, cultivation of Kent material has shown that it is capable of spreading through the production of 'bulbs' along the nodes of the stolons which develop after flowering.



Production of 'bulbs' along the stolons.
Photo by Geoffrey Kitchener, 20 January 2017

The species is best distinguished from Marsh Foxtail when in full flower, in the last two weeks in May and the first week in June, before the growth of other grasses reduces its visibility. It may, however, also be noticeable later in June, when going over before *A. geniculatus*. The small, neat, dark spikelets with their pointed glumes and the delicate upright habit of *A. bulbosus* (less geniculate than *A. geniculatus*) help separate the two species, and the 'bulb's themselves provide confirmation. FitzGerald (1989) provides some interesting observations on habitat and associated flora: *A. bulbosus* commonly grows at the interface of *Juncus gerardii* swards and the more open *Festuca rubra – Carex distans* turf, fringing the damper area where *A. geniculatus* grows or perched on tussocks in wet places trampled by cattle. At the Isle of Harty and Seasalter, the annual clovers *Trifolium micranthum* and *T. ornithopodioides* are indicator species for areas of turf which may contain Bulbous Foxtail.

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[21] Trist, P.J.O. & Wilkinson, M.J. (1989). *Alopecurus* x *plettkei* Mattfield in Britain. *Watsonia* **17**: 301-308.

[22] Bonis, A. Bouzillé, J.-B. , Amiaud, B. and Loucougaray, G. (2005). Plant community patterns in old embanked grasslands and the survival of halophytic flora. *Flora* **200**:74–87.

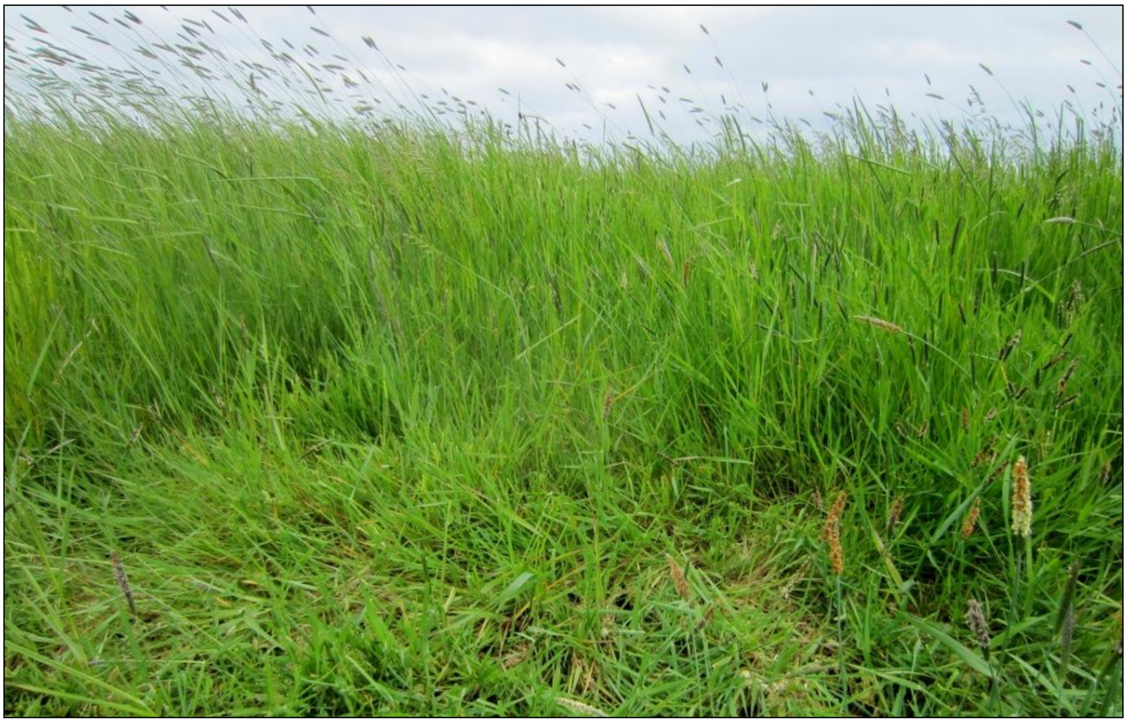
[23] Cope, A & Gray A. (2009). *Grasses of the British Isles*. Botanical Society of the British Isles, London.

Higham Marshes – habitat. Photo by Geoffrey Kitchener, 22 May 2012

Site	Grid reference	Site status	Last record date	Recorder	Comments
Higham Marshes	TQ7075	SSSI, RSPB reserve	(1) 22 May 2012 (2) 28 May 1987	(1) GK (2) RF	(1 Habitat as described in 1987 record below. Two plants at TQ 70380 75127 (with *Puccinellia fasciculata*) and one at TQ 70351 75129. May have been more, but only just coming into flower following cold wet May. (2) TQ 703 751, grazing marsh near sea wall, in winter-wet runnels in grazing between the track and a main ditch. Associated species included *A. geniculatus, Agrostis stolonifera, Carex divisa, Poa pratensis, Bolboschoenus maritimus.*
Higham, Church Street	TQ7174		1987	RF	(1) TQ 713 742, an atypical site, by a track inland of the railway, in a damp grassy waste area. *A. geniculatus* and *A. x plettkei* present. (2) TQ 712 743, coastal side of railway.
Oakleigh, Higham	TQ7274	Private land, Oakleigh	1987	RF	TQ 727 746, apparently widespread in field by railway north of Oakleigh, although heavily grazed. Associated species included *Lolium perenne, Plantago major, Poa pratensis, Potentilla anserine, Ranunculus repens, R. sardous, Trifolium repens.* Recorded by J. Braybrooke Marshall in 1938.
Cliffe Marshes	TQ77I		24 June 1991	EGP (Philp, 2010)	Edge of dyke, specimen in **MNE**.
Cooling Marshes	TQ7577	SSSI	28 May 1987	RF	Abundant on rich cattle-grazed marsh dominated by *Cynosurus cristatus* (also with *A. pratensis* and *Lolium perenne*) at TQ 754 773, in drier than usual conditions. Could be much more widely extensive. Associated species *A. geniculatus, Bellis perennis, Poa pratensis, Ranunculus bulbosus, Trifolium dubium, T. fragiferum*. Previously

					recorded by E.S. Marshall, 1892.
Bayford, Upchurch	TQ8469	Local Wildlife site. Private land, part of Bayford farm	12 June 2010	JW, conf. JP	Abundant and widespread on two areas of grazing marsh divided by a track, TQ 841 695.
Allhallows Marshes	TQ8577	SSSI	28 June 2016	GK & SK	A tussock in grazing marshes depression at TQ 85154 77178, on raised clod in uneven ground. Probably at least another tussock present, but extent of population not determined. Noticeable as going over from flowering, whereas *A. geniculatus* was not. Associated species: *Agrostis stolonifera, Alopecurus geniculatus, Bromus hordeaceus, Cynosurus cristatus, Hordeum marinum, Lolium perenne, Plantago lanceolata, Poa trivialis, Polypogon monspeliensis, Trifolium repens.*
Conyer west	TQ9564	SSSI	4 October 2018	KBRG meeting	Non-flowering material with pronounced bulbs at TQ 95962 64938 on grazing marsh.
Harty Isle, Sheppey	TR0367	SSSI, national nature reserve	29 May 1987	RF	TR 0324 6716, fairly abundant on west side of grazing marshes, in zone between recently dried runnels bearing *A. geniculatus*, and drier swards. Associated species: *A. geniculatus, Carex divisa, Festuca rubra, Juncus gerardii, Poa pratensis, Trifolium fragiferum, T, micranthum, T. ornithopodioides*.
Seasalter	TR06L, M, R, W, X		After 1990, before 2006	EGP (Philp, 2010)	TR06M and TR06X are tetrads within which the following TR0564, TR0664, TR0764, TR0863,d TR0864 and TR0964 records lie.
Seasalter – Graveney Marshes	TR0564	SSSI	26 May 1987	RF	TR 059 646. Field border along old drove south west of Sportsman (fields are semi-improved grazing). Associated species include *Bellis perennis, Poa pratensis, Ranunculus repens, R. sardous, Trifolium ornithopodioides*.
Graveney Marshes	TR0663	SSSI	24 May 2014	RG	Growing along c 15 metres of a damp rill in coastal grazing marshes, TR 0603 6321.
Seasalter – Graveney Marshes	TR0664	SSSI	26 May 1987	RF	TR 062 645. Edge of field by road south east of Sportsman.
Seasalter	TR0764	SSSI, RSPB reserve	(1) 16 June 2023 (2) 13 June 2013 (3) 26 May 1987	(1) AL (2) RG, LR & GK (3) RF	(1) TR 0781 6495. One small patch. (2) Occasional near damp field depressions on grazing marshes, RSPB reserve. (3) (a) TR 079 649. Riding stable fields. Seen by JB in 1978, 80-100 yds west of riding school barn in main jumping field. (b) TR 077 649, sheep grazed embankment behind bungalows.
Seasalter	TR0863	SSSI	(1) 28 May 2022 (2) 13 June 2013	(1) AL (2) RG, LR & GK	(1) TR 0810 6399, Seasalter Level. (2) Grazing marshes field near boundary with TR0864.
Seasalter	TR0864	SSSI, RSPB reserve	(1) 28 May 2022 (2) 21 May 2022 (3) 20 June 2013 (4) 13 June 2013 (5) 26 May 1987	(1) AL (2) AL (3) JA, LR & OL (4) RG, LR & GK (5) RF	(1) TR 088 642 (frequent in this compartment). (2) TR 0865 6429, TR 0853 6428. Occasional along the path by the main drain. (3) TR 08049 64863 in a wet meadow by a caravan park by Faversham Road. (4) Remarkably abundant in

					locations too numerous and widespread within the KWT reserve grazing marshes in this monad to cite. Generally in sward surrounding (and slightly higher than) depressions subject to winter flooding in which A. geniculatus was growing. (5) TR 081 649, TR 080 648. Riding stable fields, heavily grazed; with winter puddles and dryer 'banks'. Associated species include *A. geniculatus, Festuca rubra, Poa annua, Ranunculus sardous, Trifolium fragiferum, T. micranthum*.
Seasalter	TR0964	SSSI, RSPB reserve	(1) 28 May 2022 (2) 13 June 2013	(1) AL (2) RG, LR & GK	(1) TR 0901 6428, Typical grassland. (2) Sample location is on RSPB reserve grazing marshes at TR 09049 64290, where species was plentiful, but grass was more widespread than this.



Seasalter, with *Alopecurus geniculatus* in the foreground and the neat dark panicles of *Alopecurus bulbosus* behind. Photo by Geoffrey Kitchener, 13 June 2013

Althaea officinalis L. (Marsh-mallow)

vc 15 and 16

Rarity / scarcity status

In Great Britain as a whole, *Althaea officinalis* is not considered to be particularly at risk (its threat category being of 'Least Concern'), but in England its rate of decline places it as **Near Threatened**. Additionally, its localisation in southern coastal areas of England and Wales has resulted in it being regarded as nationally **scarce**. It is by no means scarce in Kent, but is treated as a county axiophyte, indicative of good habitat.

Oare Marshes. Photo by Lliam Rooney, 6 July 2010

Account

Althaea officinalis was first recorded in Kent by Gerard in 1597, who found that it "growth very plentifully in the marshes...alongst the river of Thames, about Woolwich, Erith, Greenehyth, Gravesend". West Kent Thameside locations were vanishing or had vanished by the time of Hanbury & Marshall (1899), who found it decreasing through drainage. Its main Kentish areas are now Romney Marsh and the tidal Medway; but the 70 tetrads recorded in Philp (1982) had fallen to 49 in Philp (2010), a factor cited being that the Romney Marsh populations have apparently been in decline due to modern ditch management and through grazing marshes being converted to arable.

However, the conversion to arable seems less threatening to Marsh-mallow than an increase in sheep grazing pressure, coupled with a reduction in hay cropping. Comparison between ditch surveys of 1985 and 1993-94 carried out for English Nature at Walland Marsh has shown that *Althaea officinalis* was respectively 28% and 24.5% more frequent in adjacent arable ditches than in pasture ditches.[24] One result of grazing pressure in Romney Marsh appears to be that the species has become more confined to habitats which sheep cannot reach, such as ditch margins by roads or farm tracks outside stock fences, or along steep-sided ditches which have not been cut back (Owen Leyshon, personal communication). A comparison of the 1985 and 1993-94 surveys mentioned above showed a decline for *Althaea officinalis* from being the 19th most abundant species to the 27th.

A cluster of records in the Sandwich area in Philp (1982) could not be re-found in Eric Philp's later survey, but the species has subsequently been recognised as still present.

There are oddities of inland distribution due to an introduction or escape at the River Darent, Eynsford (not mapped below, but recorded in 1993 at TQ56M); a survivor on an old nursery site inland of Faversham; and the existence of a colony at Bethersden which would have been nearer the coastal marshes in historic times, although on higher ground (around the 35m contour line) and not proximate, so this is probably also an introduction or escape as well.

Oare Marshes. Photo by Sue Buckingham, 8 August 2010

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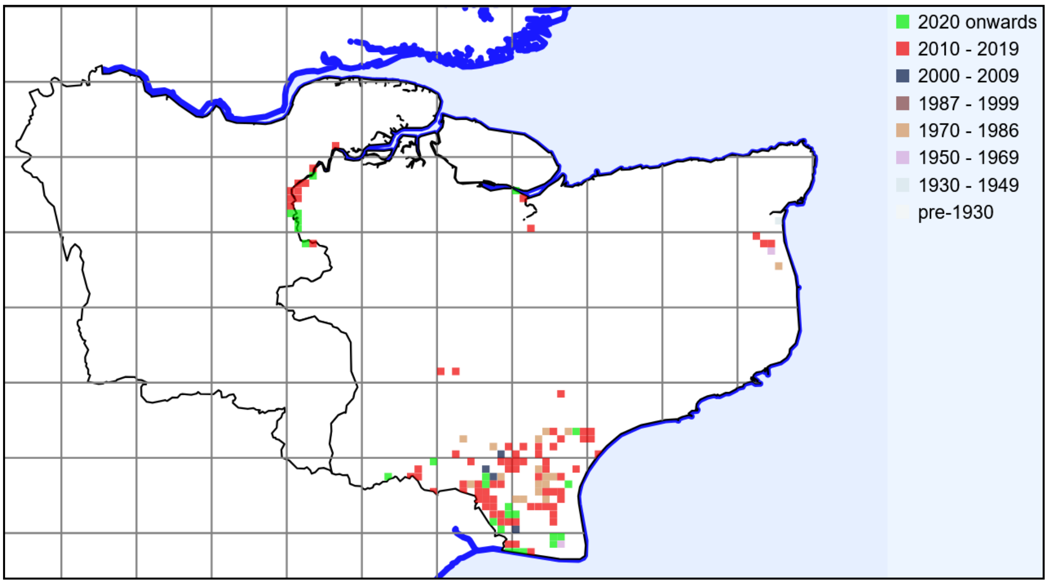
[24] Williams, R., Banks, B., Cameron, R. & Cooke, R. (2000). *Ditch monitoring at Walland Marsh SSSI 1993/4*. English Nature Research Report 132.



***Althaea officinalis* records to 2024 mapped at monad level, from** BSBI **database**

Overall, the 2010-24 records amount to 62 tetrads (102 monads), so the ostensible decline of 30% between (1982) and Philp (2010) is not borne out by subsequent recording, which only shows a 13% decline. This is probably due either to under-recording or habitat loss in the Romney Marsh area.

Althaea officinalis grows on the ungrazed banks of brackish water ditches and in the transition between upper saltmarsh and freshwater habitats, including by tidal rivers. Its stem and roots provide food for the Marsh Mallow Moth (*Hydraecia osseola*), whose UK distribution is restricted to Kent and the East Sussex border. Surveying for the moth in 2024 has produced data for the number of plants present alongside some Romney Marsh ditches, e.g. 2,850 flowering plants from TQ 97795 21377 to TQ 98097 20554 (876m) recorded in 2024; 2,400 between TQ 99408 23167 and TQ 99163 22977 (c.350m); 1,040 between TR 08583 33488 and TR 08586 33604 (115m, mostly at high density in the southern 60m); and a further 1,040 from TQ 96303 26767 to TQ 96436 26950 (c.250m).

Habitat, Snargate roadside. Photo by David Steere, 15 August 2015

Habitat, Oare Marshes. Photo by Sue Buckingham, 8 August 2010

Anacamptis morio (L.) R.M. Bateman, Pridgeon & M.W. Chase (*Orchis morio* L.) (Green-winged Orchid)

vc 15 and 16

Rarity / scarcity status

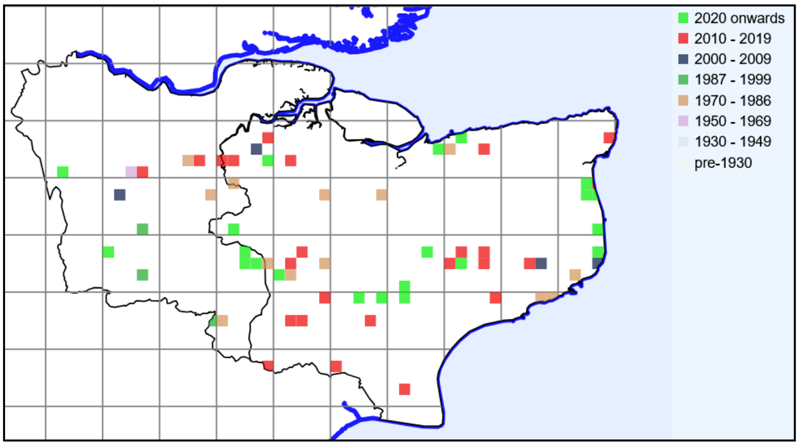
Anacamptis morio is regarded as **Near Threatened** in Great Britain as a whole, but **Vulnerable** to the risk of extinction in England. Whilst not scarce, either in England or in Kent, its English threat categorisation is that it is **Vulnerable** to the risk of extinction. As it is considered to be an indicator of old unimproved nutrient-poor grasslands (and as such is registered as a Kent axiophyte), any threat is likely to be as regards the retention and management of this type of habitat.

Lawn at St. Joseph's catholic church, Chestfield.
Photos by Lliam Rooney, 29 April 2011

Account

The first Kentish record of *Anacamptis morio* is by Edward Jacob, who in his *Plantae Favershamienses* (1777) refers to it as "In Meadows – very common", also mentioning the vernacular name, Female Fool Stones. The assessment of "common" was continued by Hanbury & Marshall (1899), particularly in the occurrence of the orchid on chalk and Wealden clay. It is, however, in Kent not limited to these substrates and is still widely distributed across the county in short grassland on various soil types. It is found in churchyards, by roads, in damp meadows and on chalk. Colour variants are common.

By the 1940s-60s, Francis Rose considered that its "common" status, as abundant in many old permanent pastures throughout Kent, was in the past and that it was then far rarer, due to the conversion of such pastures to leys or arable, and becoming more confined to the chalk, where was less vigorous in growth, though still widespread. It was, however, still present on London Clay, even locally abundant on that substrate in Sheppey, where we now have no recent records.



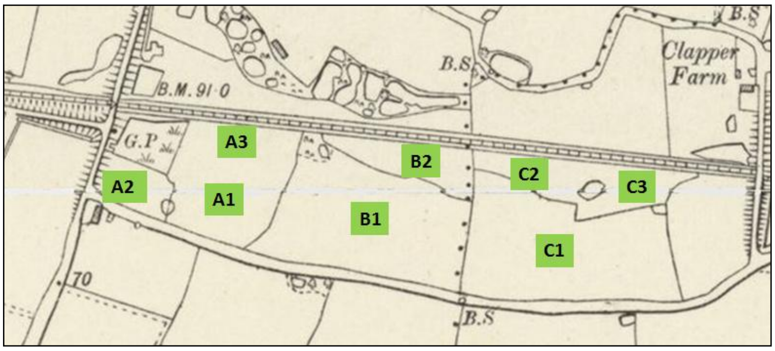
Anacamptis morio Kent records as at 2024 mapped at tetrad level, from BSBI database

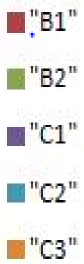
Eric Philp found that it had gone from some former sites through land drainage and ploughing, reflected in a decline from 24 tetrads (Philp, 1982) to 17 (Philp, 2010) across the administrative county.

However, recording 2010-24 has located it in 45 tetrads 51 monads) as shown in the accompanying distribution map. Far from being in decline, it appears to have been increasing in recent decades. This contrasts with the wider position: a comparison of the species' area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 32% in the likelihood of its being recorded. Also, the BSBI threatened plants surveys carried out 2008-2013[25] re-found presence in only 57% of old recorded sites selected, with disproportionate losses in lowland England and Wales; whereas the three sites selected for Kent (one of which was actually in vc14, East Sussex) were still extant.

Whether and how the species has increased in Kent since the 1970s is, however, not quite straightforward. The accompanying distribution map gives records at tetrad level in order to enable comparison with times when this, and not monad recording, was standard. It will be seen that, although there are many recent records (2010-24), they have not covered many of the locations which were known in the 1970s and 1980s. Indeed, there are several hectads from which it appears to have gone since the beginning of this century. Given the plant's reputation for being an indicator of 'old' unimproved grassland, the possibility that it is also a 'come and go' plant is surprising and, while there may perhaps be some habitat losses and overlooking involved, the potential for colonising new sites is discussed further below.

Threats to the species may arise from habitat damage or destruction, but are more likely to relate to lack of grassland management. Many of our Kent sites are managed by regular hay-cutting or, for golf courses, gardens and churchyards, by mowing. The premier county site, at Marden Meadow, is managed by the Kent Wildlife Trust and has been designated as Kent's Coronation Meadow. The principal part of the Meadow, neutral grassland of long standing, is marked as compartments A1-3 on the accompanying map (showing field boundaries as at 1909). The meadow was extended in 1999, given as compartments B1-2 and C1-3 on the map. The expansion of *Anacamptis morio* onto the extension compartments is monitored by the Trust, with a view to guiding future management. Counts of orchid flowering spikes on the extension compartments are given below, from which it will be seen that numbers built up considerably in compartment B1, and began to do so in B2; numbers in C1 have not shown material increase up till 2017 since 2004; and those in C2 and C3 are insufficient to show on the graph.





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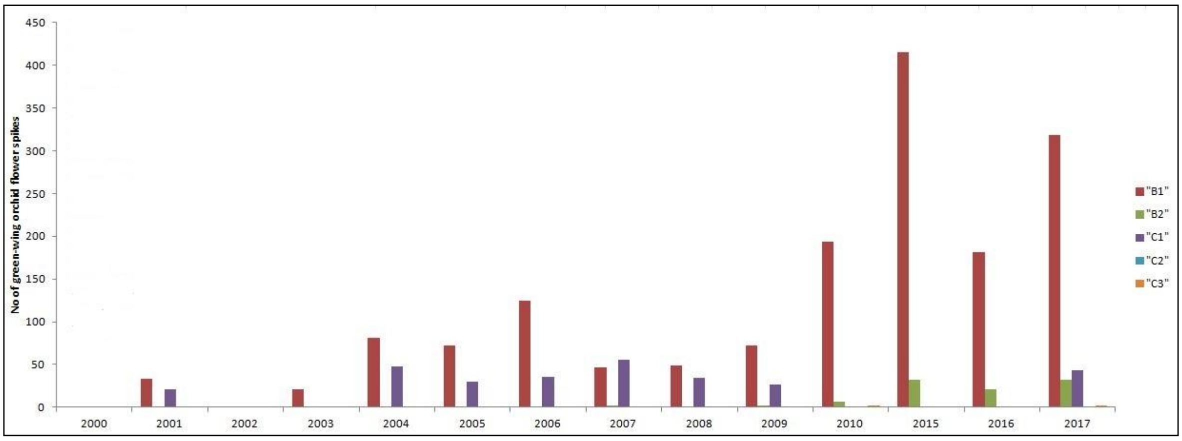
[25] Walker, K.J., Stroh, P.A. & Ellis, R.W. (2017) *Threatened Plants in Britain and Ireland*. Botanical Society of Britain and Ireland, Bristol.



The status of the species as an indicator of old unimproved grassland is being modified by the ability to establish it elsewhere from seed, as has been done through the off-site spreading of hay from the Marden Meadow reserve. This has been achieved at a field near Queendown Warren and (KWT e-news May 2015) at Tucker's Farm, Warehorne (TQ9734), where plants appeared 'a couple of years' after hay spreading. This artificial distribution is reflected in the records given in the present distribution mapping. Hay spreading has been undertaken as well at Payne's Fields and Highwood Meadows[26], also in the Marden area, the latter of which carried over 700 plants in 2016[27]. Green hay has also carried the species from the Chestfield church lawn site. It has appeared in 2022 at Down House, Charles Darwin's home, following introduction. The species may be even more versatile in establishment than even these appearances may suggest: in 2017 it was seen on the sedum-covered roof of a carport at Headcorn (not without precedent outside Kent: a single plant was seen on an Islington Council roof in 2016).

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Downe (metropolitan vc16)	TQ4361	English Heritage	28 May 2022	AOR	TQ 43168 61093, Down House, re-introduced by head gardener.
Polebrook	TQ5047	Private land, SSSI	(1) 17 June 2023 (2) 17 May 2012 (3) 15 May 2011	(1) KBRG / KFC meeting (2) GK (2) SL	(1) TQ5047, Polebrook Meadows. (2) Two sites in adjoining meadows. Northern site TQ 506 477, c. 100 x 65m, 162 spikes widely scattered, variable density. Southern site TQ 5061 4768, c.20m more or less linear, 6 scattered spikes. Neutral meadow on Weald Clay with many ancient grassland indicator spp. (3) 42 flower spikes spread out in one field at TQ 506 477 and TQ 507 477.
West Kingsdown, School Lane	TQ5761	Private garden	5 June 2010	(reported to) DJ	Over 200 plants on lawn.
Great Buckland	TQ6663	Private garden	14 April 2013	JP	Rosettes on chalk grassland slope in garden.
[Scotney Castle]	[TQ6835]	[National Trust]	[(1) 8 May 2012 (2) 19 May 2010]	[(1) GK, SK (2) L&DH]	[(1) 3944 spikes (including some salmon-pink colour variants) counted in three habitats surrounding the house at TQ 687 353 (-4): (a) terraced lawn slopes (b) flat areas of terraced lawn and (c) the adjoining conservation meadow. Terraced lawn is mown grassland, somewhat acid; slopes

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[26] But it seems (per Lou Carpenter) that *O. morio* was present at Highfield Meadows by 2013, but the first hay-spreading was not carried out until after then, and the subsequent observed spread of orchids did not tally with the area of hay spread.

[27] *Ecology and Evidence*, KWT, Winter Newsletter2017-18.

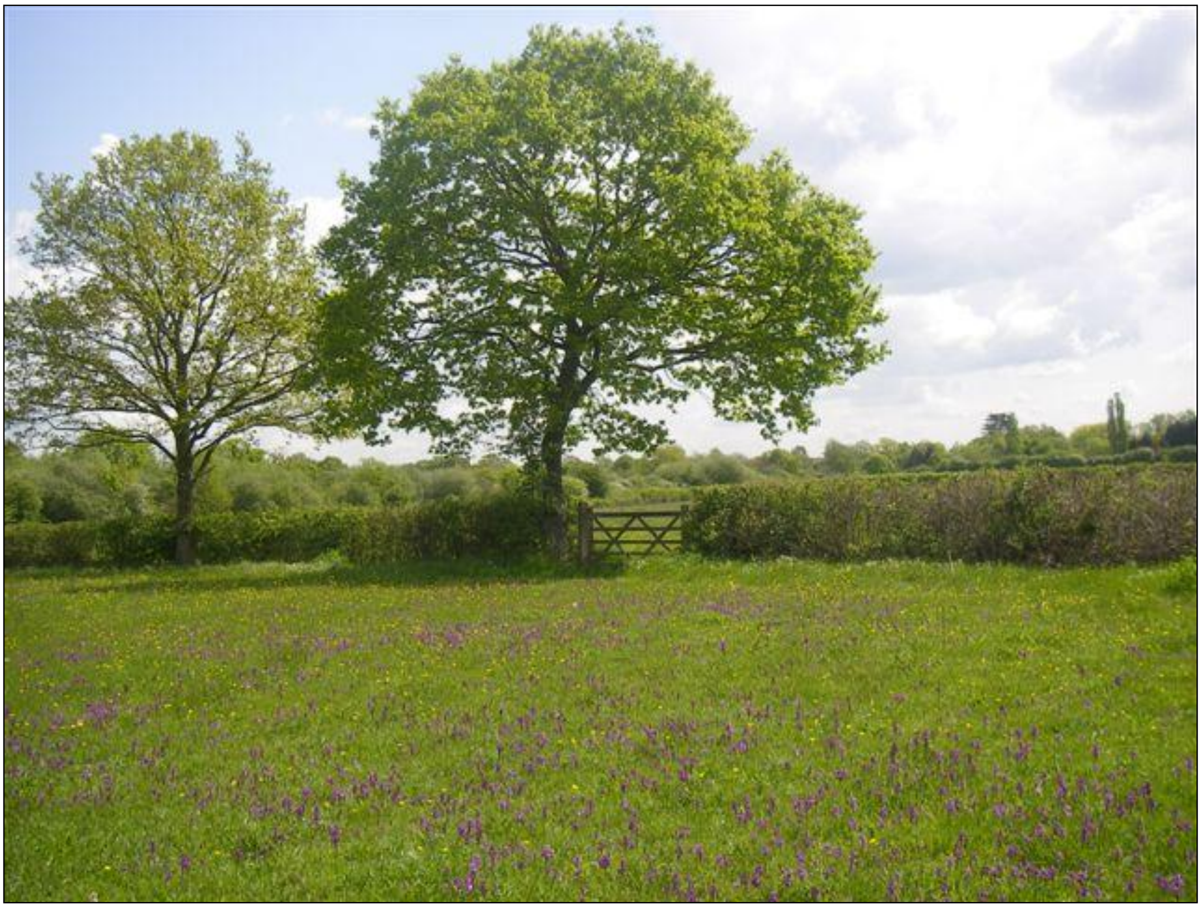
					are grassier than flat areas, which have much tightly mown *Calluna vulgaris* and are mossier. Lawn management entails mowing from mid-July, with cuttings left in situ for several days to spread seed. Conservation meadow has taller sward and includes *Carex caryophyllea* and *Silaum silaus*. (2) At least a thousand spikes. **N.B. this site is in vc 14 (East Sussex), not vc 16 (West Kent). It was included in Philp (2010) because the administrative county of Kent extends to this point.** National Trust count in 2013 was 2800 spikes (DJ from head gardener).]
Holborough	TQ7062	KWT managed reserve	20 May 2017	DJ	TQ706627, about 20 small plants in two separate groups in newly acquired KWT fields above the marshes, perhaps introduced with cattle feed from Marden Meadow.
Wouldham	TQ7263	SSSI, KWT managed reserve	20 May 2010	SW	One plant flowered on Wouldham Common Reserve TQ 7240 6345, presumably from hay brought here from Marden Meadow, communicated by D J, 2013.
Coxheath south	TQ7350		7 May 2021	SG	At least three flowering plants in private residential garden at TQ7391 5087, seed perhaps arrived unwittingly on boots from visits to Marden Meadow.
Chainhurst south east	TQ7446		10 May 2024	PHa	TQ 74261 46050, one flowering plant where green hay from Marden Meadow spread 3 years beTQ 753 443, garden off Howland Rd, found here for first time.fore, new location.
Marden east	TQ7544		April 2024	SE	
Marden Meadow	TQ7644	KWT managed reserve	(1) 28 April 2019 (2) 2011	(1) DS (2) Various observers	(1) Thousands in the usual meadows to the west of KWT reserve. Of note is that the meadows to the east up to and including the railway line are now showing a few *A. morio* plants as well. (2) Present in thousands, TQ 763 445. See chart in main text for counts 2001-17.
NE Staplehurst	TQ7744		18 May 2019	KBRG/KFC meeting	2 flowering spikes at TQ 77236 44820 and a further single spike at TQ 7701 4472.
Hempstead	TQ7863	KWT RNR	7 May 2022	SCo	TQ 78664 63093, a population of c.100 spikes, all consistently normal dark purple, including one exceptionally fine clump, KWT roadside nature reserve, Lidsing Rd Just south of the entrance to the Elms Court Garden Centre. [Apparently the reserve was originally designated for Yellow Vetchling, with the orchid only having arrived in 2019, increasing to c, 50 by 2021, not introduced here by hay spreading.].
Darland Banks	TQ7866	KWT managed reserve, Access land	2013	AR	Six plants flowered in a clump in the middle of the West Bank TQ 7810 6624, communicated by DJ. Apparently, KWT has spread hay from Marden Meadow at this reserve.

Sandhurst Cross, St Nicholas churchyard	TQ7927	Church property	(1) 12 May 2014 (2) 5 June 2010	(1) JP (2) SB	(1) St. Nicholas church. (2) TQ 79045 27319, one plant (a second had been damaged). Additional to Philp (2010) listing.
Frittenden north	TQ8142		2024	LC	TQ 81320 42285 centre point of small meadow with c.600 flowering spikes this year.
Benenden	TQ8335	Private grounds	16 May 2013	SB	Eight plants, possibly more, with seven flowering spikes, around a lawn in private grounds of hospital.
Headcorn	TQ8344	Private residential property	28 April 2017	JT	TQ 830 446, on sedum-covered roof of carport in Mill Close, Headcorn.
Queendown Warren	TQ8362 and TQ8363	Old records on SSSI /KWT managed reserve, recent not.	(1) 8 May 2019 (2) 16 May 2015 (3) 17 May 2014 (4) 1 May 2014 (5) 18 May 2013 (6) 19 May 2012 (7) 14 May 2011	(1)TS (2) & (3) DJ (4) SB (5). (6) & (7) DJ	(1) Below Queendown Warren, TQ 83000 62913. (2) At TQ 838 633 and vicinity, over 200 small plants flowering in the newest field acquired by KWT where Marden Meadow hay was spread. (3) TQ 838 633, three or four plants seen in field where KWT had spread hay from Marden Meadow. According to Wild Kent magazine Winter 2014/15, there were 116 or so flowering plants beforehand, but had been dug up and stolen. (4) A single flowering plant at TQ 83287 62484, on KWT reserve but some 500 metres south east of known colony and on slope east of Cradles Road, by public footpath. (5) Two spikes flowering at TQ 8302 6280 and a singleton at TQ 8311 6288. See below for origins. (6) TQ8309 6285, Only 4 plants found at TQ 8309 6285 where there were many before, but in addition this year singles found at TQ 8308 6283, TQ 8303 6280, and TQ 8302 6281. (7) TQ 8309 6285: 20 flowering plants in middle of the pond field, believed to have been under cultivation until not long before. Whilst ostensibly this would suggest greater flexibility in colonizing than is often credited to the species, apparently hay from Marden Meadow has been spread on the field over several years. There is a history of occurrence before this introduction. FR knew the species here in the 1960s (but grid reference given as TQ8363, where last seen by NW in 1986).
Sandpit Wood, Clapper Hill	TQ8435		June 2012	MW	One spike in unimproved neutral pasture at TQ 843 359.
Between Headcorn and Grafty Green	TQ8546		29 April 2014	SB	One flowering plant with three spikes in a small hay meadow at TQ 85408 46826.
North of High Halden	TQ8938		7 May 2014	SB	Three flowering plants in meadow, one at TQ 89165 38218, one at TQ 89061 38246 and one at TQ 89095 38236. Associated species: *Luzula campestris*, *Ranunculus bulbosus*, *Stellaria graminea*.
Wittersham	TQ9027		(1)20 May 2018 (2) 11 May 2017	(1) PS (2) PS	(1) TQ9027 (2) Near edge of large lawn, 4 spikes, first noticed 10 years before.
Bethersden - Shadoxhurst	TQ9538		27 May 2021	SB	Some 20 plants in flower or going over in old unimproved grassland,

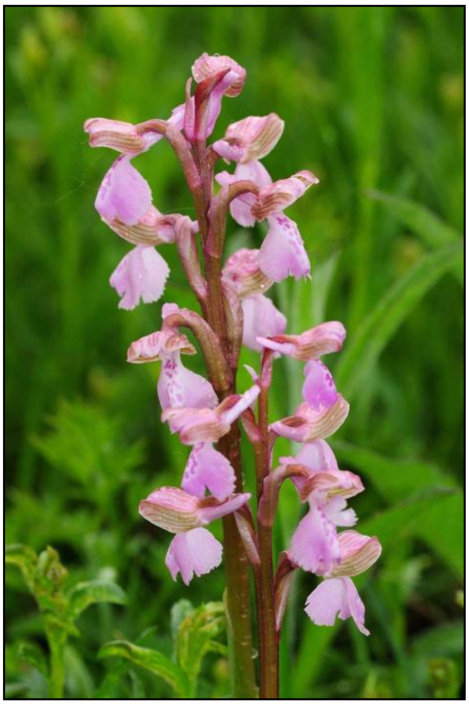
					TQ9564 3863 to TQ9563 3860. Private land managed for hay and sheep pasture.
[Warehorne]	[TQ9734]		[May 2015]	[PR]	[Planted. Six plants seen on field where Marden Meadow hay was spread a 'couple of years' before. Grid reference inferred.]
Kingsnorth west, Ashforf	TQ9939		1 June 2023	AL & KB	TQ996390. Meadows behind Ashford Road.
Sevington south	TR0339		(1) (2) 25 May 2021	(1) & (2) AJ	TR 030 397, in rough grassland close to a soil heap, possibly threatened by development.
Ashford south east - Sevington	TR0340		9 May 2023	AJ	TR 0371 4034, Cheeseman's Green Railway Bridge.
Wye Crown	TR0746	Wye & Crundale Downs SSSI	(1) 7 May 2021 (2) 22 May 2013	(1) AG (2) AG	(1) TR 0304 3971. (2) In the Crown field, TR 07123 46660 – one plant in flower. (2) One in flower at TR 0709 4667, formerly more abundant according to some observers (20-30 spikes), although recorder has never seen more than 5 or 6. Grass long and rank, threatening survival unless there is more grazing.
South east of Seasalter	TR0964		(1) 4 May 2022 (2) 25 May 2016	(1) & (2) CO	(1) Wraik Hill LNR: Four in field below "The Oaks" plus one in next wet field. (2) 4 plants flowering in field below The Oaks at TR 097 642.
Elmsted	TR1145, TR1245, TR1246	Private land	(1) 21 May 2013 (2) 7 May 2012	(1) & (2) AG	(1) 109 plants in flower at TR 1194 4594 to TR1209 4603. Also, at least five plants at TR 12008 45984, in a privately owned field. (2) 13 spikes in bud or in flower, although there have been 200 - 300 in past years in this field, which is similar to other East Kent downland sites. Other species present were *Polygala vulgaris, Dactylorhiza fuchsii, Listera ovata, Plantago media, Gymnadenia conopsea, Brachypodium pinnatum* agg., *Orchis mascula, Primula veris.* (Colony stretches from TR 1194 4594 at its most south-westerly to TR 1209 4603 at its most north-easterly, and in 2013 was seen also to also take in part of TR1245.)
Elmsted east	TR1244		25 May 2023	DT	About 6 plants on a long-term arable reversion area at TR 1213 4405 (there is a very narrow/rabbit run sloping somewhat diagonally up the bank north eastwards and they are on this run c. 20m up from the bottom hedge).
Chestfield, Primrose Way / Chestfield Rd	TR1366	Church property	(1) 6 May 2022 (2) 29 April 2020 (3) 19 May 2019 (4) May 2018 (5)3 May 2012 (6) 29 April 2011	(1), (2) (3) & (4) JPu (5) KBRG meeting (6) JPu, LR	(1) 1358 flower spikes on church lawn. (2) 1003 flower spikes counted on church lawn. (3) 888 flower spikes counted on St Joseph's Church lawn TR135 664. (4) 1145 flowering spikes on the church lawn. (5) 535 spikes in total. Fairly densely concentrated in north west corner of somewhat damp and very mossy front lawn of church. Outliers scattered across lawn, on narrow verges either side of surrounding paths and on lawn to rear of church (6) 450 spikes on St Joseph's catholic church lawn, the last local

					remnant of neutral meadow, TR 13501 66478.
Park Gate Down	TR1646	KWT managed reserve [but grid reference is outside], Access land	27 May 2012	WR	TR 166 461, two plants flowering in first section of Park Gate Down from the road.
Bleangate	TR1664		(1)20 May 2019 (2) May 2018	(1) & (2) JPu	(1) 203 flower spikes counted in Braggs Lane meadow, TR168 646. (2) Recorder reports a count of 196 flowering spikes from a privately owned meadow at approx TR 168 646. These were originally introduced by the recorder from the Chestfield church population via green hay.
Arpinge	TR1838	SSSI	1 May 2014	AG	TR 1841 38147, one plant in flower in chalk grassland on gentle south-facing slope, where recorder has known it to occur occasionally in the past.
Lydden Hill	TR2545	SSSI	(1) 26 May 2016 (2) 23 May 2012 (3) 30 April 2012	(1) SC (2) DJ (3) AG	(1) TR 258 450, c. 100. (2) A large number of plants, TR 2584 4509 to 2585 4510, viewed from Warren Lane roadside. Estimated at 300-400 with several hundred *O. mascula* by AG, who recorded just a handful of plants in bud in April (3), at TR 258 450, north west facing site.
Sandwich Bay estate	TR3557	SSSI	(1) 23 May 2022 (2) 5 May 2018 (3) 14 May 2010	(1) KBRG meeting (2) SB (3) PH	(1) 600-700 flowering in Sandwich Bay Observatory Trust's Whitehouse field (2) counted 85 flowering spikes at footpath across St Georges . (3)(a) 147 plants flowering in damp grassland, TR 358 575. (b) 470 plants flowering in damp grassland, TR 358 578.
Sandwich Royal St George's	TR3558	SSSI	(1) 29 April 2024 (2) 4 May 2018 (3) 19 May 2016 (4) 21 May 2013	(1) SB (2) SB (3) SB (4) CO	(1) More than 200 flowering in dune grassland between sea and road from TR 35770 58996 and TR 35824 58836. (2) Counted 826 flowering spikes on St Georges golf course from TR 3588 5852 to TR 3585 5860. (3) c. 120 flowering spikes between TR 3581 5885 and TR 3577 5896, alongside golf practice range. (4) Five plants in grassland between beach and road. Also, c.200 plants adjoining footpath across golf course at c. TR358584.
Sandwich Bay	TR3559	SSSI	(1) AL, AWr, TH (2)26 May 2021 (3) 29 April 2021 (4) 19 May 2020 (5) 19 May 2016	(1) (2), (3) (4) & (5) SB	(1) TR 356 593. (2) (a) Old practice range, four flowering in the scrubbed over dune slack, TR 35167 59149. (b) 17 flowering spikes n the old well-known slack on Princes golf course TR 3539 5915. (3) 40 - 50 flowering spikes in dune grassland on Princes old practice range from TR 35226 59150 to T R35145 59277. A visit made just over two weeks later (16/05/21) revealed a total of 1181 flowering spikes in that area. (4) TR 35388 59160, nine flowering spikes in old dune slack between St Georges and Princes golf courses.

					(5) Nine flowering spikes in old well-known dune hollow with *Ophioglossum vulgare,* TR 3539 5915. 60 more flowering spikes in old dune grassland alongside golf practice range from TR 35226 59145 north to TR 35170 59232.
Sandwich Bay estate	TR3657	SSSI	(1) 6 May 2022 (2) 14 May 2010	(1) SB (2) PH	(1) Two flowering at TR 36259 57834, in a fenced-off area between the Estate and St George's golf course. (2) 700 plants flowering in damp grassland, TR 361 579.
Sandwich Bay estate	TR3658	SSSI	26 April 2011	JA, LR	Golf course population included 2 or 3 white flowered plants, TR 3608 5816.
Kingsdown	TR3746		27 April 2020	SB	Four flowering spikes on lawn of private property in Kingsdown.
Walmer	TR3750		12 April 2024	SC	Walmer promenade at TR 37782 50731 and TR 37783 50721.
Broadstairs	TR3966		22 April 2017	DS	Single flower in a neglected front garden, status unknown, unlikely to have been planted.

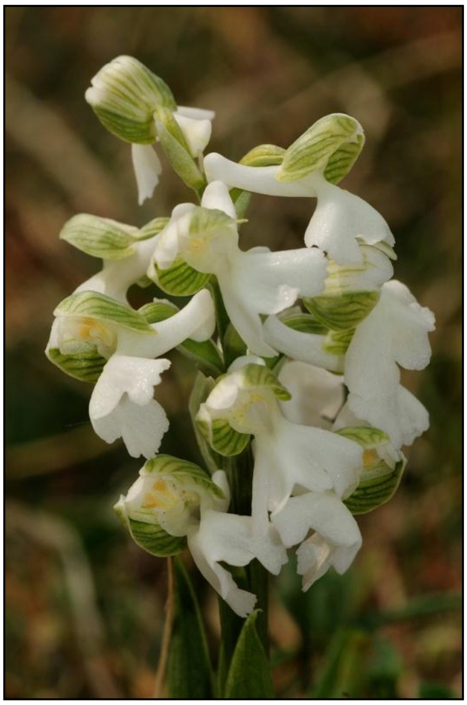


Marden Meadow. Photo by Lorna Holland, 17 May 2011



Sandwich Bay estate,
colour variant.
Photo by Lliam Rooney,
26 April 2011

Marden Meadow,
colour variant.
Photo by Lliam Rooney,
23 May 2013



Anthemis arvensis L. (Corn Chamomile)

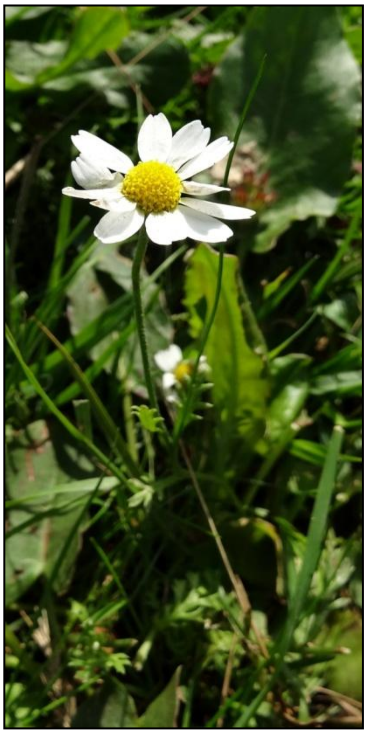
vc 16; gone from vc 15

Rarity / scarcity status

In England and in Great Britain as a whole, Corn Chamomile is considered to be an **Endangered** species. Its decline parallels that of several other arable weeds, which struggle against modern farming practices, particularly herbicides. It is an archaeophyte, or ancient introduction, and had been considered extinct in Kent, but is now very **rare**. Recent records are unlikely to represent continuity with older populations, but probably reflect recent introductions.

Account

The first published record for Kent is likely to have been that by William Pamplin near Westerham mentioned in Daniel Cooper's 1837 supplement to his *Flora Metropolitana,* although Hanbury & Marshall (1899) point out an earlier reference by Clusius to its occurrence at London, which might cover West Kent, albeit that this cannot be ascertained (and in any event, it may have been confused with *Tanacetum parthenium*, Feverfew[28]). There is, however, an 1829 specimen collected by William Wilson from Dartford, at Manchester Museum. Hanbury & Marshall (1899) regarded the species as probably common, found in fields, roadsides and waste ground, chiefly on light soils. The sites mentioned by them seem likely to have been on chalky or sandy soils. The difficulty in specifying how common Corn Chamomile was then arose because of potential confusion with other similar species. An assessment for a similar period is given in the *Woolwich Surveys* (1909), *Anthemis arvensis* being considered frequent as a colonist in the borders of cornfields in north west Kent.



Chartwell. Photo by Stephen Lemon, 6 September 2015

Corn Chamomile declined drastically in the county during the 20th century, and there are few records for the second half. Francis Rose noted half a dozen records from the 1950s/60s: cornfield west of Blean Church, 1958; chalky field near Darenth Wood, 1955; cornfield on chalk at Little Mongeham, TR 323517, 1960; field by A20 Harrietsham, 1962; arable on Weald Clay at Great Chart, TQ 972 407 1952; and Ashford railway sidings, 1955. It is worth noting that he also had it reported around that time from a cornfield at the Warren, TQ 693677, which might point to potential for re-finding at Ranscombe Farm. Philp (1982) treats it as very local and rare, with records at Eynsford (TQ56M, where it was recorded by Rodney Burton in 1974, as an introduction with grass seed); Meopham (TQ66I); Challock (TQ94Y); Stalisfield Green (TQ95L); and Yorkletts (TR06R, recorded by Eric Philp in 1976 from a roadside verge). During the 1991-2005 survey, however (Philp, 2010), *Anthemis arvensis* was not seen at all and it was considered that it might well be extinct.

Habitat, Chartwell. Photo by Stephen Lemon, 6 September 2015

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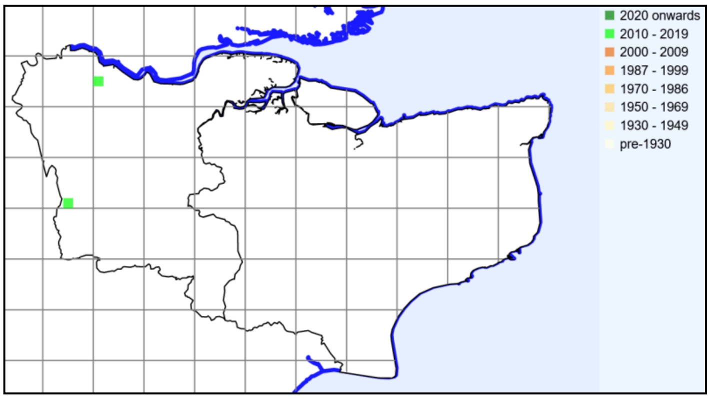
[28] See Pearman, D. (2017). *The Discovery of the Native Flora of Britain & Ireland*.

It may be that this is the case as regards occurrences as an arable weed on chalk or sandy soils in the character of the species as an ancient introduction. However, there are potential sources as a modern introduction. It is sometimes listed as a component of wildflower seed, although in Kent the similar species *Cota* (*Anthemis*) *austriaca* (Austrian Chamomile) is sometimes found in such sowings and appears likely to have been substituted. Corn Chamomile, at least in the 1960s, has also been identified as a contaminant of grass and clover seed.

We have two fairly recent records which may reflect such sources of introduction. The first is from Crayford town centre (TQ513748, Bexley Lane), where recorded by Professor Mick Crawley in 2010 as originating from a wildflower mix.



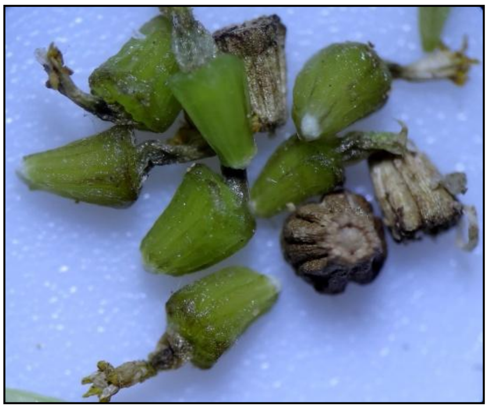
***Anthemis arvensis* Kent records as at 2024 mapped at tetrad level, from BSBI database**

The second is from near Chartwell (TQ 454 508), where recorded by Stephen Lemon in 2015. The habitat was a disturbed bank of soil next to a pond created before 1990 in a sheep-grazed pasture. An arable history for this location has not been identified, and the site is on Weald Clay near its junction with the Atherfield Clay, so it differs from the habitat of traditional arable occurrences on light soils, albeit that the soil had a sandy element. A few low growing flowering plants were present with *Matricaria chamomilla* (Scented Mayweed). There were no other species likely to have derived from wildflower seed, so the probability is that Corn Chamomile here originated as a grass seed contaminant, although it was not apparent that the grass sowing was particularly recent. It was not found elsewhere in the field upon search, which may indicate a sowing relating to the pond creation or the management of its surrounds.

Habitat, Chartwell. Photos by Stephen Lemon, 6 September 2015

Anthemis arvensis may readily be overlooked in the presence of similar species, such as *Anthemis cotula* (Stinking Chamomile), *Matricaria chamomilla* (Scented Mayweed) or *Tripleurospermum inodorum* (Scentless Mayweed). All, however, have distinctive odours – or in the case of the last of these, an absence of odour.

Matricaria chamomilla and *Tripleurospermum inodorum* both also differ in the absence of scales among the yellow disk-florets. These are present in both *Anthemis arvensis* and *A. cotula*, but the latter has warty ribbed achenes, whereas those of *A. arvensis* lack warts on the ribs. The ribs (*c.*10) also help distinguish the non-compressed achenes of *A. arvensis* from the compressed achenes of *Cota austriaca*, with their 2-3 faint ridges on each face.



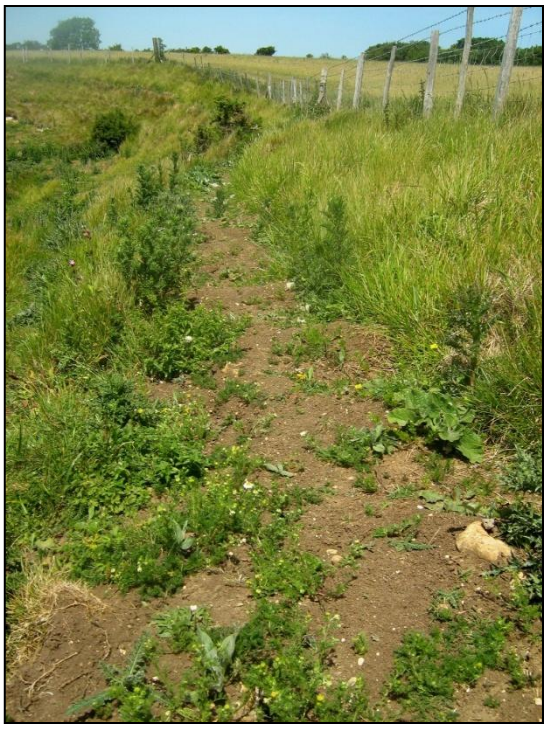
Achenes, from Chartwell material. Photo by Stephen Lemon, 17 August 2015

Anthemis cotula L. (Stinking Chamomile)

vc 15 and 16

Rarity / scarcity status

Widespread in the British Isles, but much less so in the west and north, *Anthemis cotula* is an archaeophyte-colonist, probably native in the Mediterranean, but here an introduced weed of cultivation. In England and in Great Britain as a whole, it is regarded as **Vulnerable**, as are several other arable weeds with substantial declines in population associated with modern farming practices, including recent herbicides. In Kent, there are many more records than would enable it to be treated as rare or scarce, but it is treated as a Kent axiophyte, indicative of good arable habitat.



Lydden NNR. Photo by Geoffrey Kitchener, 2 June 2011.
Habitat: disturbed clay-with-flints on the crest of the chalk escarpment

Account

Anthemis cotula has long been associated with arable activity in Kent. A Late Bronze Age/Early Iron Age pit with cereal and legume seeds at Manston Road Ramsgate was found to include *Anthemis cotula* seeds, although it was considered that a possibility existed of deposits having become mixed with later material if one accepted that the species was a Roman introduction to Britain[29]. At the same site, evidence of abundant *Anthemis cotula* was found in mid-6th to 7th century and mid-11th to early 13th century contexts, in both cases taken to be associated with the cultivation of cereals, peas and beans. Seeds have been found with charred cereal grains in Roman pits at Smeeth dating from 80 to 200 A.D.[30]; also associated with a Romano-British corn drier in use during the late 2nd / third century A.D. at Swanscombe[31] and at a second century A.D. Roman pit at Preston Farm, Shoreham[32]. Archaeological features dating to the first century A.D. at Westhawk Farm, Ashford excavated in 1998-9 were associated with seeds of *Anthemis cotula* which has been suggested as a characteristic of more Romanised settlements of the time, perhaps associated with the use of asymmetrical ploughs, rather than the traditional native ard[33]. Late Roman and mediaeval contexts produced many *Anthemis cotula* seeds in the course of excavations around Northumberland Bottom, Southfleet for the HS1 rail route[34]. The species was not found in plant material at a Romano-British site at Park Farm South East, Ashford, but seed head fragments were present in a mediaeval gulley there, with cereal grains. Seeds were present in a Saxon (650-1100) pit at Boarley Farm West, perhaps as crop-processing waste used for fuel[35].

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[29] Dawkes, G., Hart, D., Grant, K. & Swift, D. (2019). *Beyond the Wantsum: archaeological investigations in South Thanet.* Spoilheap Publications.

[30] C. Stevens (2006). *The charred plant remains from Bower Road, Smeeth, Kent (ARC 440/99).* CTRL Specialist Report (Archaeology Data Service, distributor).

[31] A. MacKinder, Museum of London Archaeology (2010). *A Romano-British site at Swanscombe, Kent.*

[32] B.J. Philp (2014). *Discoveries and excavations across Kent, 1970-2014.*

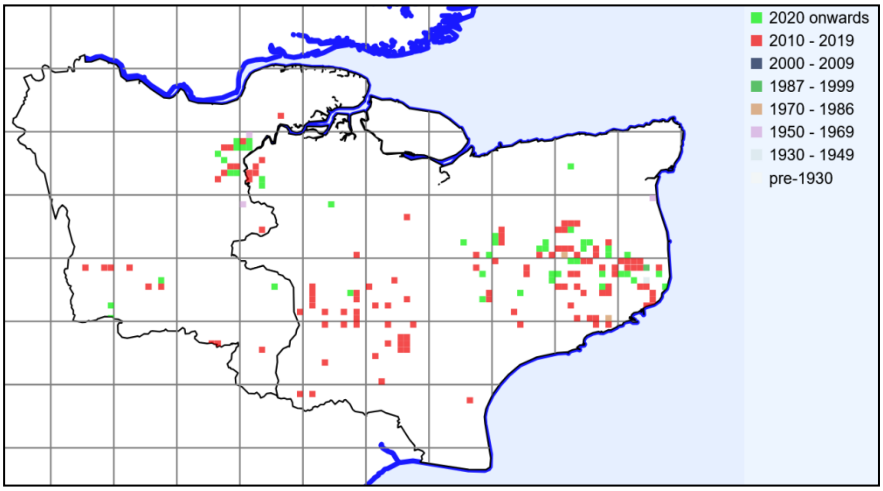
[33] A.B. Powell, Wessex Archaeology (2012). *Excavations south east of Park Farm, Ashford, Kent.*

[34] A. Davis (2006). *The charred plant remains from Northumberland Bottom, Southfleet, Kent (ARC WNB 98).* CTRL Specialist Report.

[35] J. Giorgi (2006) The plant remains from White Horse Stone, Pgrim's Way and Boarley Farm, Aylesfoed and Boxley, Kent. CTRL Specialist Report. London and Continental Railways.

Kent mediaeval finds include recovery of seed from a pit which may have held waste sievings from grain preparation at Eastchurch, probably from twelfth and thirteenth century agricultural activity[36]. An analogous find was made in an excavation at Boys Hall Road, Willesborough, where mediaeval features from the late twelfth / early thirteenth century were present, and the floor deposits of mediaeval buildings yielded charred cereal grain with arable weed seeds, *Anthemis cotula* being amongst the most abundant[37]. Seeds were also found in twelfth century deposits at Shadoxhurst associated with a mediaeval stripfield system.[38]

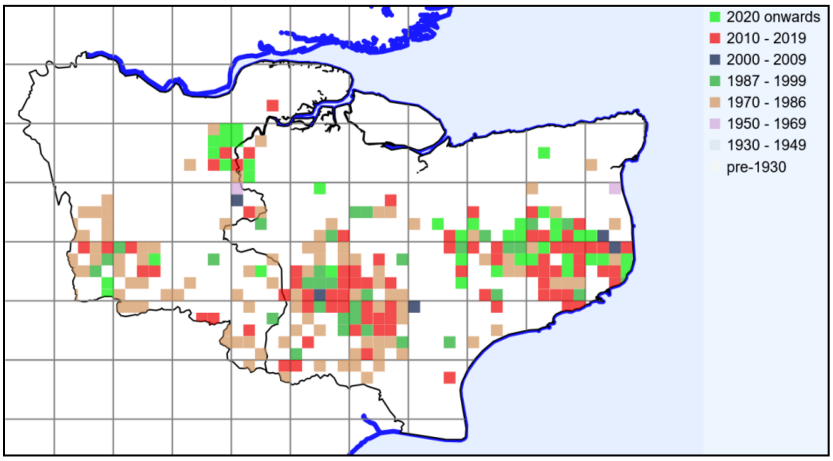
So far as concerns conventional botanical record publication, the first Kent record of Stinking Chamomile is as one of the plants listed by Thomas Johnson in his *Iter Plantarum*, as encountered by him and his fellow apothecaries on 13 July 1629 along the main road from Gravesend to Rochester. Hanbury & Marshall (1899) regarded the species as common (*'too common'* said Edward Jacob in his *Plantae Favershamienses*, 1777) and generally distributed in fields and on waste ground, but it has since declined considerably and continues to do so. Even though 89 tetrad records are listed by Philp (2010), this represents a 50% decrease over the previous county survey (Philp, 1982). This is in spite of its possessing a wider tolerance of soil conditions than many of the other -declining arable weeds, as it grows both on the light soils, including chalk, and on the heavier clays. There are many records which appear to map onto chalk in East Kent, but which may instead be on overlying clay-with-flints.



This decline is questionable, in that our 2010-24 records amount to 119 tetrads (166 monads). However, this total still falls short of the 177 tetrads recorded for 1971-80, so there appears to have been a substantial decline in the longer term.

***Anthemis cotula* Kent records as at 2024 mapped at monad level, from BSBI database**

Our register data at monad level given here includes relatively few older records, since recording was not usually undertaken at this level of resolution before 2010.



In order to see the trends of losses, it is necessary to view mapping at tetrad level.

***Anthemis cotula* Kent records as at 2024 mapped at tetrad level, from BSBI database**

The losses on Wealden clay are

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[36] S. Stevens, Archaeology South East (2010). *An Archaeological Investigation of land at Kingsborough Farm and Kingsborough Manor, Eastchurch, Isle of Sheppey*

[37] A. Davis, *The Plant Remains* (specialist report) in E. Eastbury & L. Blackmore (2010) *Excavations at Boys Hill Road, Willesborough, Ashford*.

[38] Nicholls, H. (2021).Evidence of a late Iron Age / early Roman settlement and an early mediaeval strip field system at Shadoxhurst. *Archaeologia Cantiana* **142**: 118-131.

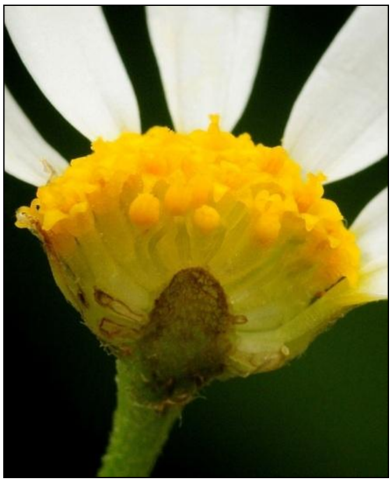
especially evident. Farming changes over the 1980s included increases in autumn-sown cereals and in the application of herbicides. The former is less significant for *Anthemis cotula*, as it has germination peaks in both spring and autumn, and both are compatible with autumn-sown crops. However, increased herbicide applications are likely to have been a material factor (see the *Spergularia arvensis* account for related data) although the species has some resistance, particularly to early-generation herbicides. Indiscriminate insecticides could also affect populations given that *Anthemis cotula* appears self-incompatible and is pollinated by flies[39].

There is usually a very substantial population in the fields of Ranscombe Farm, which appears to be more responsive to the effect of minimal tillage (harrowing) than to a ploughing regime; it is not clear whether this is an effect of autumn or early spring germination surviving minimal tillage (which would be likely to move seedlings, rather than burying them, as with ploughing).[40]

Lydden NNR. Photo by Lliam Rooney, 2 June 2011

Anthemis cotula is one of several Chamomiles and Mayweeds which may be found on disturbed ground, particularly on field margins. The most frequent of these in Kent are *Tripleurospermum inodorum* (Scentless Mayweed) and *Matricaria chamomilla* (Scented Mayweed). These may all be distinguished by scent, or lack of it.

Tripleurospermum inodorum is more or less odourless; *Matricaria chamomilla* is pleasantly aromatic; and *Anthemis cotula* has a rather sickly-sweet unpleasant smell. The latter also has solid flower heads with scales between the disk-florets. *Matricaria chamomilla* has hollow flower heads with no scales between the disk-florets; and *Tripleurospermum inodorum* has solid flower heads with no scales. Whilst these characters should be sufficient to distinguish *Anthemis cotula,* it is a very variable species in size, habit and parts such as ray-florets and bracts.



Lydden. *Anthemis cotula* showing solid flower head. Photo by Lliam Rooney, 14 July 2015.

Lydden NNR. Photo by Lliam Rooney, 2 June 2011

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[39] Kay, Q.O.N. (1971). Biological flora of the British Isles: Anthemis cotula L. *Journal of Ecology* **59**: 623-636.

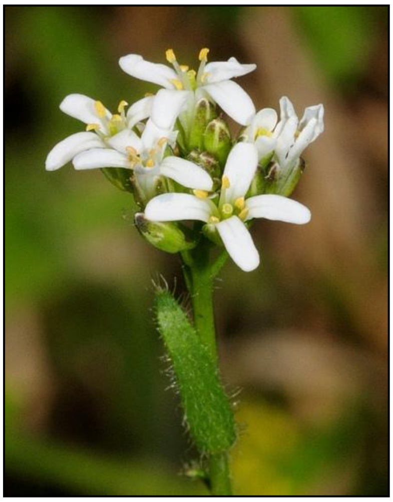
[40] Moyse, R.I. & Shellswell, C. (2016). A comparison between the impacts of ploughing and minimum tillage on arable plant assemblages at Ranscombe Farm Reserve, Kent, UK. *Conservation Evidence* **13**: 33-37.

Arabis hirsuta (L.) Scop. (Hairy Rock-cress)

vc 15; may be gone from vc 16

Rarity / scarcity status

Arabis hirsuta is widespread in many habitats across Great Britain, and so its conservation status is of 'Least Concern'. In England, however, its rate of decline and limited distribution means that it is regarded as **Near Threatened**. In Kent it may be reduced to five localities and is **very scarce.**



Account

Edward Jacob published in 1777 the first Kentish record of "Hairy Tower Mustard" as "*On old Walls at* Colkins *in* Boughton – *very uncommon*"[41]. Whilst he was concerned with plants around Faversham, the county-wide assessment of Hanbury & Marshall (1899) put its status as being "not common" – or (as Marshall wrote in the Victoria History of the County of Kent, 1908) "keeps to the chalk, and even there is comparatively rare".

Stockbury. Photo by Lliam Rooney, 28 May 2012

Francis Rose regarded it as rare as a native and knew it in the 1940s at Barham (Gravel Castle); near Iffin Wood; odd plants at Ryarsh sandpits and the in-filled Higham canal; and the old Stockbury and Kingsdown sites referred to in Hanbury & Marshall (1899.

Philp (1982) provided seven tetrad records[42]; but the 1991-2005 county survey (Philp, 2010) recognized a decline to only two records, from Stockbury (TQ86F) and Kingsdown (TR34T), which at least demonstrate some continuity in the species' Kentish survival.

Roadside Nature Reserve

Stockbury, habitat. Photo by Geoffrey Kitchener, 22 May 2012

The Stockbury location constitutes two dry south east facing chalky banks in TQ8360: the first backed by trees and scrub, and constituting the edge of an arable field (adversely affected by ploughing to the boundary and by herbicide); and the second (nearby) being the northern boundary of the A249. The species favours dry, sunny exposed locations on banks, outcrops, chalk grassland and walls. In its A249 site, managed by the Kent Wildlife Trust it increased its population, in numbers and extent, following scrub clearance, which has opened up the habitat after 2009. There it was

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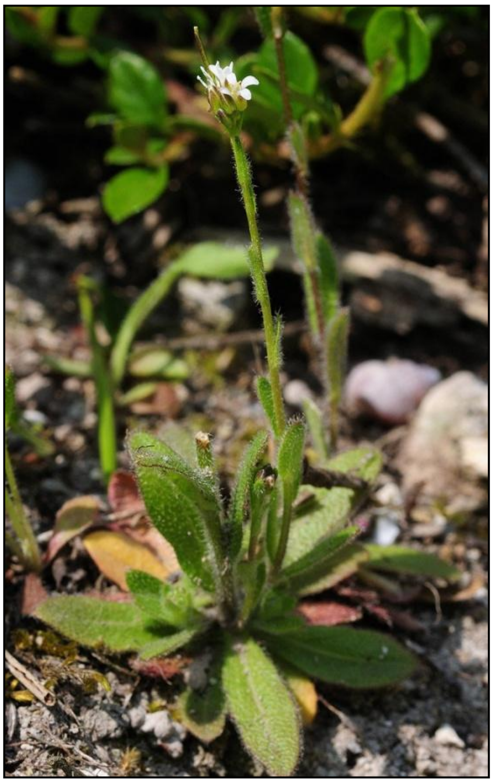
[41] Colkins still exists (TR 03360 59256) but as it was built in 1729 any walls which were old in 1777 are more likely to have related to earlier structures; the dutch-gabled brick barn to the east appears to be 17th century.

[42] These are TQ54G and M (Westerham); TQ46Q (Pratt's Bottom, although little suitable habitat is present); TQ85P (Hucking – FR recorded it in 1986 at Rumsted Court, TQ8459); TR15G (there is also a 1949 record for a chalky roadside north of Swarling Farm, Chartham Downs); TR25A (Barham – there is a 1945 record at Gravel Castle); TR34T (Otty Bottom, Kingsdown – there is also a 1954 record for the Lynch).

(2012) most plentiful towards the base of the bank, on crumbling chalk, seldom growing more than 2 metres above the base. This may reflect the direction of seed dissemination, but could reflect restriction by previous scrubbing of the bank down from the woodland above. By 2023, however, scrub had returned and was advancing down the base of the slope out onto the verge. While 30 plants were counted then, most of them were around a concrete cover over a services chamber, having been out-competed on the lower chalk embankment slopes and most of the rest of the highway verge.



The Kingsdown location is similarly an open chalk bank, but with few plants. The largest Kent population is omitted from Philp (2010). Joyce Pitt[43] in 2000 assessed *Arabis hirsuta* as still quite common on bare chalk banks in the Dover area. This was confirmed by a KBRG meeting in 2013 which found between 1500 and 2000 plants growing near Dover on steep northeastern and northwestern slopes, particularly where management had created open areas of bare chalk.

Stockbury. Photo by Lliam Rooney, 28 May 2012

A further site was discovered in 2017 near Hucking, less than 1.5km from the Stockbury colony, on a grazed chalk grassland slope, believed to have been an old location for *Polygala amarella* (Dwarf or Kentish Milkwort).

Lydden, habitat. Photo by Steve Coates, 31 May 2023

In 2023 yet another site was identified, by Steve Coates, with 29 plants counted on the ridge of a chalk spoil heap near Lydden formed from excavating the rail tunnel on the line from Dover to Canterbury in about 1860. The chalk represents a challenging habitat for plants generally, although *Arabis* was growing on a very thin layer of soil on the flattened top of the heap.

The species is a calcicolous biennial, apparently sometimes living longer but monocarpic, so there is a need to recruit itself from seeding, where an open habitat appears to be beneficial. Growing against a white / gray chalk slope, the Hairy Rock-cress is not easy to see when not in flower; and when in flower, the top of the inflorescence may appear dissociated from the base of the plant, by virtue of the length of the stem.

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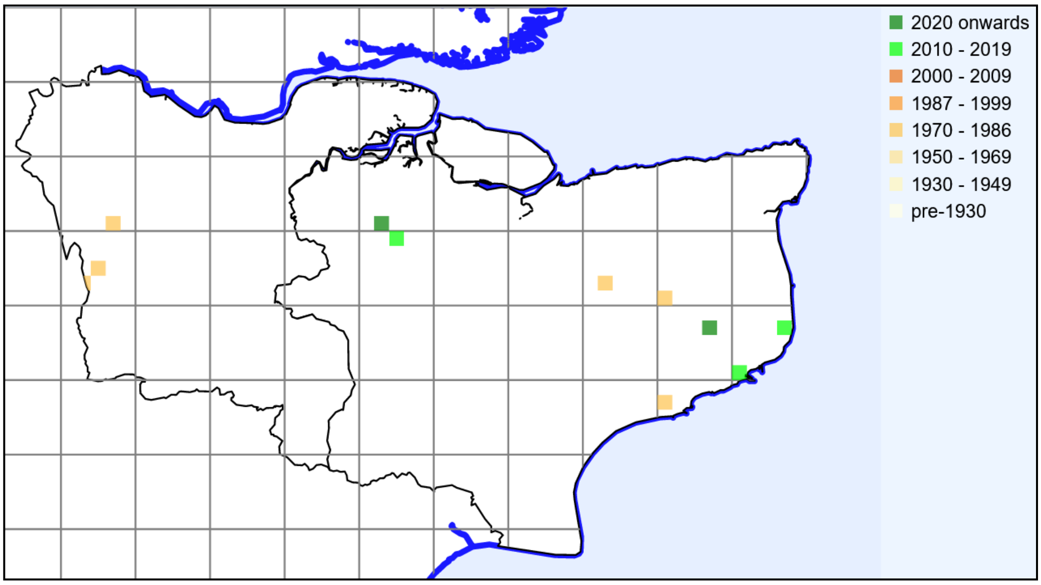
[43] Pitt, J. 2000. *Vascular Plants*, in Waite, A (ed.) *The Kent red data book: a provisional guide to the rare and threatened flora and fauna of Kent*. Kent County Council.

Arabis hirsuta **Kent records as at 2024 mapped at tetrad level, from BSBI database**



Site	Grid reference	Site status	Last record date	Recorder	Comments
Stockbury (1)	TQ8360		After 1990, before 2006	EGP (Philp, 2010	South-facing chalk bank /arable margin below woodland. Species not seen in 2011 and 2012 (GK), when site found to be tight-ploughed to the boundary and affected by herbicide.
Stockbury (2)	TQ8360	KWT managed RNR	(1) 9 June 2023 (2) 23 May 2012 (3) 12 May 2011 (4) 25 May 2010 (5) 28 May 2009	(1) & (2) GK (3) GT (4) GT (5) KWT	(1) (a) TQ 83276 60418, six plants on level c.3m out from A249 roadside chalk bank (which was too scrubbed over to enable *Arabis* to subsist there), but in thicker vegetation than with other records made here this day, including bramble and *Clematis vitalba*. (b) TQ 8326 6040, three plants on lower-mid slope of steep chalk road bank (A249), ground mostly bare but associated flora comprising : *Blackstonia perfoliata*, *Carpinus betulus* (seedlings), *Cotoneaster horizontalis* (widespread), *Leucanthemum vulgare*, *Linaria vulgaris*, *Pilosella officinarum*, *Polygala vulgaris*, *Poterium sanguisorba*, *Teucrium scorodonia*. (c) TQ 83286 60421, Nineteen plants (plus one more c.3m sw of the rest), around concrete cover slabs (?over services chamber) in A249 verge, whose margins provided a more open aspect than much of the verge (but still more hospitable than the scrubbed-over road bank where plants used to grow). Associated species: *Anacamptis pyramidalis*, *Bellis perennis*, *Centaurea nigra* agg., *Cerastium glomeratum*, *Clematis vitalba*, *Cruciata laevipes*, *Daucus carota*, *Galium album*, *Holcus lanatus*, *Hypericum hirsutum*, *Leucanthemum vulgare*, *Linaria vulgaris*, *Origanum vulgare*, *Plantago lanceolata*, *Poa pratensis*, *Poa trivialis*, *Potentilla reptans*, *Rubus caesius* (cf.), *Rumex acetosa*, *Trifolium campestre*,

					Trisetum flavescens, *Veronica chamaedrys*, *Veronica officinalis*, *Ervum tetraspermum*. (2) 44 plants, from TQ 83264 60417 to TQ 83292 60436, virtually all on lower parts of south-facing, sparsely vegetated chalk slope (highway bank). (3) 61 plants, from TQ832604 to TQ833605. (4) 52 plants, from TQ8325 6040 to TQ8329 6043 accompanied by good chalk flora (typical of open ground and wood margin). (5) One plant only.
Rumsted, north of Hucking	TQ8459	Woodland Trust Hucking estate	17 May 2017	MA	TQ 845 598, north of Rumsted Lane on steep east-facing grassland slope with chalk flora, a short way above the road (where it has a more southerly aspect]. There is a depression close by with some exposed chalk and the plants (only a few, some in fruit) were above. [Not seen, 9 June 2023, GK.]
Lydden north	TR2646		31 May 2023	SC	TR 26566 46079, on the ridge of the chalk spoil heap from excavating the rail tunnel on the line from Dover to Canterbury in about 1860. It is pure chalk with a very thin layer of soil on the flattened top, about 30m long by 4m wide, and perhaps 3m high. Count of 29 flowering plants in a 5m-long area, varying in height from about 5cm to 20cm, all on the top of the heap in relatively lush vegetation compared with other sites. Not present on the barer sides of the slope so far as the recorder could see.
Dover Western Heights	TR3142		11 June 2013	KBRG meeting	Estimated 1,500 to 2,000 plants on steep chalk slopes on either side of and above Military Road. Populations centred around TR 31316 41029 on northeast facing slope and around TR 31349 41068 and TR 31352 41026 on northwest facing slope. Greatest density of plants where recent scrub clearance by English Heritage & White Cliffs Countryside Partnership had revealed areas of bare chalk. Plants becoming thinly scattered as sward growth thickened. Associated typical chalk flora, including *Hippocrepis comosa* and *Polygala vulgaris*.
Dover Western Heights	TR3140		11 June 2013	KBRG meeting	Scattered plants at TR 3135 4099 on northeast facing slope above Military Road, on areas of bare chalk. Slope managed by English Heritage.
Kingsdown	TR3746		(1) 13 June 2012 (2) 4 June 2012 (3) After 1990, before 2006	(1) CO (2) SB (3) EGP (Philp, 2010)	(1) At least 11 plants at usual site along south east side of road at Otty Bottom. (2) 15 plants (possibly a few more very tiny ones) on a sparsely vegetated chalk bank along Otty Bottom road, TR 37081 46752.

Artemisia maritima L. (Sea Wormwood)

vc 15 and 16

Rarity / scarcity status

Artemisia maritima is a not uncommon plant which grows around the coasts of the British Isles, albeit not in northernmost and north west Scotland. It is not regarded as being particularly at risk in Great Britain as a whole (the risk being designated as of 'Least Concern'); but in England there is some evidence of decline, and it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 28% in the likelihood of recording the species. In Kent, it is neither rare nor scarce, but Philp (2010) shows a decline in tetrad records of 26% over those given in Philp (1982) – calculated over a different period, of course, but a material decline nonetheless. It is treated as a Kent axiophyte, an indicator of good coastal habitat.

Oare. Photo by Lliam Rooney, 9 September 2008

Account

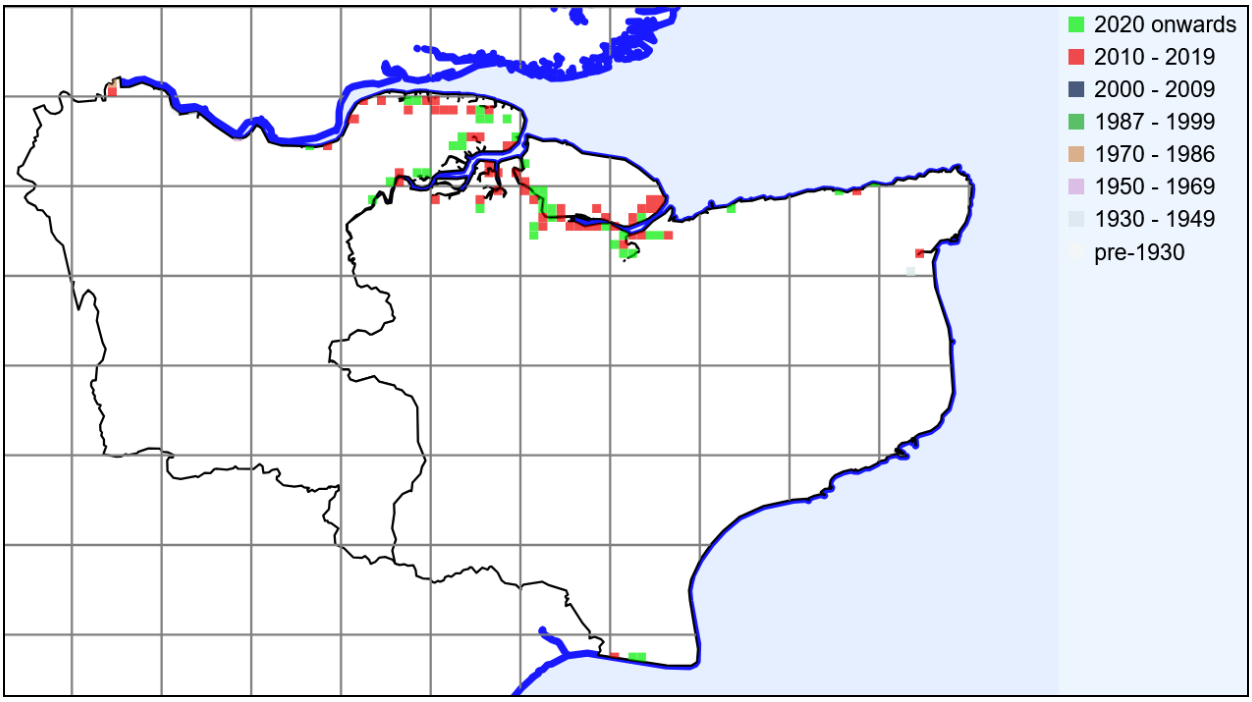
The first published record for Kent was made in Thomas Johnson's *Iter Plantarum* (1629). His sighting followed a view of the fleet at Chatham Dock on 14 July of that year, after which he botanised along the land bordering the tidal Medway below the Royal Dock, where it was present with other saltmarsh species. Johnson also noted it in 1632 further along the north Kent coast, as growing in a small inlet, commonly called Westgate Bay. Subsequent observers, whose sightings are listed by Hanbury & Marshall (1899), recorded it in many places along the Thames from Woolwich westwards, thence to the Medway and Swale estuaries, on Sheppey, and along the north coast to Margate; picking up again on the east coast between Deal and Dover, and as far south as Folkestone. Hanbury and Marshall's assessment was that it was frequent on muddy sea-shores and saltmarshes. They also referred to a variant *gallica,* with short and congested panicle branches, as being not uncommon, but this is currently considered to be part of a range of variation with numerous intermediates and without ecological significance.

Francis Rose described it as a native growing on drier upper parts of muddy and sandy saltmarshes, and on sea and tidal river walls, coastal beaches at salting edges; common from Swanscombe to Seasalter and up the Medway to Cuxton; at Whitstable and Swalecliffe; frequent in the Stour estuary and East of Reculver; and at Dymchurch and West of Dungeness.

Habitat, Hoo. Photo by David Steere, 6 July 2016

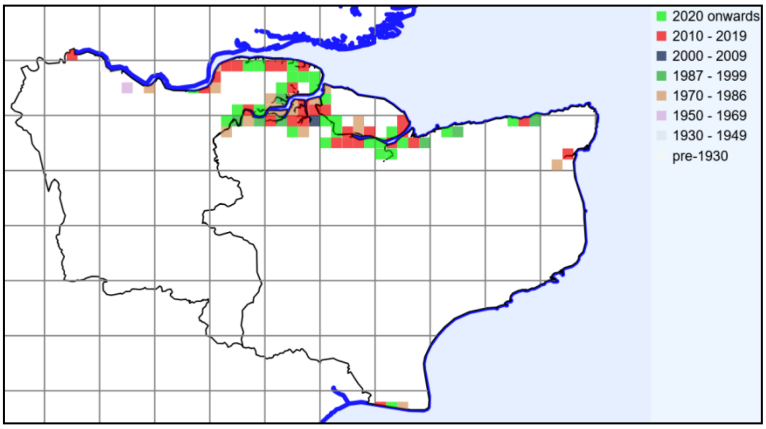
Philp (1982) recorded Sea Wormwood as found on the drier parts of saltmarshes and at the edge of sea-walls, being common in suitable habitats in the north of the county, but very scarce elsewhere. Those records included a couple of tetrads around Pegwell Bay, but nothing to correspond with the old records from Deal to Dover and Folkestone. There were, however, findings at Dungeness which are not represented in Hanbury and Marshall's listings. The total number of tetrads with the species present was 75.

However, in Philp (2010), which covers 1991-2005, the total has reduced to 55. The ostensible losses include presence at Swanscombe, Cliffe, parts of the Medway estuary, Sheerness, Sandwich and some of Dungeness. Recording for 2010-24 suggests that the position since is one of steady state since then, with 57 tetrads (93 monads) showing presence of the species. Our register data at monad level given here include relatively few older records, since recording was not usually undertaken at this level of resolution before 2010.



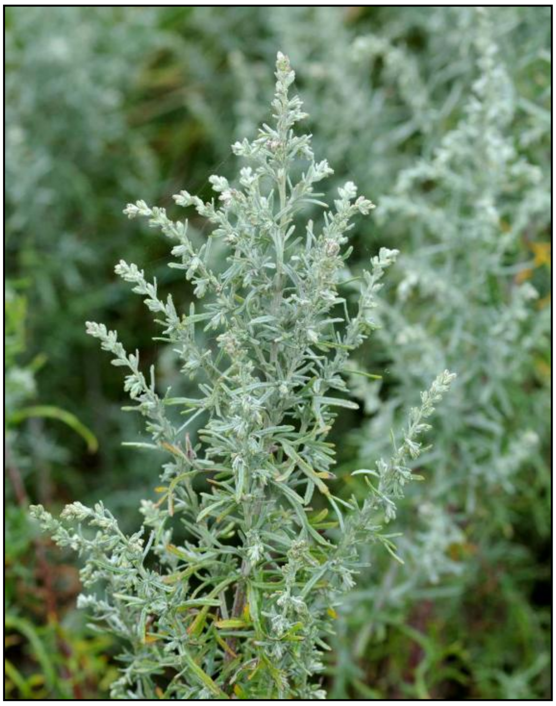
***Artemisia maritima* Kent records as at 2024 mapped at monad level, from BSBI database**

The position regarding historic losses is best considered by mapping at tetrad level (as below), since this enables records published in Philp (1982) and Philp (2010) to be taken into account, where not superseded by more modern sightings in the same tetrads. It will be seen that very few losses apply to Philp (2010) sites; rather, they relate to records in the 1971-80 survey of Philp (1982). Most of these lie round the Medway estuary, where the absence of recent record may be an effect of riparian development together with difficulties of access.



***Artemisia maritima* Kent records as at 2024 mapped at tetrad level, from BSBI database**

More generally, however, It is possible that there is a cumulative effect of sea defence works, although the main works along the north Kent coast were undertaken in the 1950s in response to the flooding of 1953, which falls within the period considered in the English Red List assessment (in computing national decline), but not the period of the two Kent Atlas surveys. Stretches of coastline now bounded by a stone or concrete sea wall are less hospitable for Sea Wormwood, although not wholly hostile.



Seasalter. Photo by Lliam Rooney, 29 August 2008

Artemisia maritima in Kent grows where exposed to saline influence, but this tends to be in raised areas at the margin of tidal inundation subjected to spray, rather than where regularly fully covered by the tides. It is often present on sea-walls and may grow on the stone batter or revetment at the level also frequented by *Limbarda* (*Inula*) *crithmoides* (Golden-samphire).   In saltmarsh, it grows in the upper parts, sometimes where shingle has been thrown up. Its finely divided foliage contrasts with the succulent leaves which middle and lower saltmarsh species possess, in order for the latter to cope with higher levels of inundation. It is not readily confused with any other British species in its habitat.

Arum italicum Mill. subsp. *neglectum* (F. Towns.) Prime (Italian Lords-and Ladies)

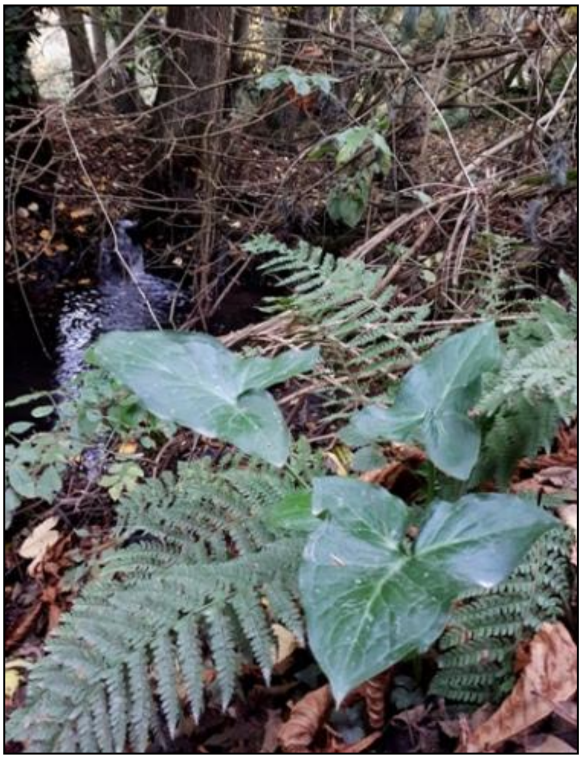
vc 15

Rarity / scarcity status

Arum italicum is known in the British Isles as two subspecies. They were formerly treated as two species, but the existence of intermediate populations in their wider distribution led to them being separated only as subspecies, of which subsp. *italicum* is a Continental taxon, especially around the Mediterranean, and subsp. *neglectum* is a British native. The latter is known from south and south west England, south Wales, the Channel Islands and the Isles of Scilly. Although regarded as **Near Threatened** and **scarce** in Great Britain as a whole, in England its conservation status is considered to be one of 'Least Concern'. In Kent it appears to have only one possibly native station and is accordingly **rare**.

Account

Arum italicum subsp. *neglectum* was first discovered in England in 1854, which encouraged botanists to seek it out, and J. Cosmo Melvill considered that he had found it in 1879 in the Folkestone area, which he published in 1883 along with purported sightings by Dr M.T. Masters[44]. Again in 1888 he claimed having found more, at the base of Sugar Loaf and Caesar's Camp, including plants which he thought might be hybrids with *Arum maculatum* (Lords-and-Ladies).[45] This claim met with an observation[46] by the Devon botanist, T.R. Archer Briggs, that Melvill's purported sighting of *A. maculatum* and *A. italicum* in flower at the same time did not accord with the plants' behavior, as the former has normally gone over when the latter begins. However, Melvill's claim retained credence as Hanbury & Marshall (1899) included these records, treating the plant as native, but very rare, in Kent. Marshall even recorded it himself near Postling.



Saltwood. Photo by Stephen Lemon, 9 November 2018

The validity of these claims was considered by C.T. Prime in 1954[47] and 1960[48]. He examined Melvill's specimens and could find none from Kent which definitely belonged to *A. italicum*; some of his specimens were clearly misnamed. Prime also searched most of the claimed localities with Francis Rose and they were unable to confirm those early records. However, in 1960, I.J. Hughes reported finding *A. italicum* at Saltwood. This was confirmed by Prime, and Francis Rose accepted the record as native. He visited in 1961, recording it in his manuscript Flora of Kent as on the steep, shaded, well-drained and calcareous rocky banks of a stream, in a copse on Sandgate Beds, south of Brockhill School, Saltwood, TR 147 357. It was also visited by the Kent

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[44] J. Cosmo Mevill (1883). Arum italicum Mill. in Kent. *Journal of Botany* **21**:376.

[45] J. Cosmo Mevill (1888). Arum italicum (Mill.). *Journal of Botany* **26**: 348-349

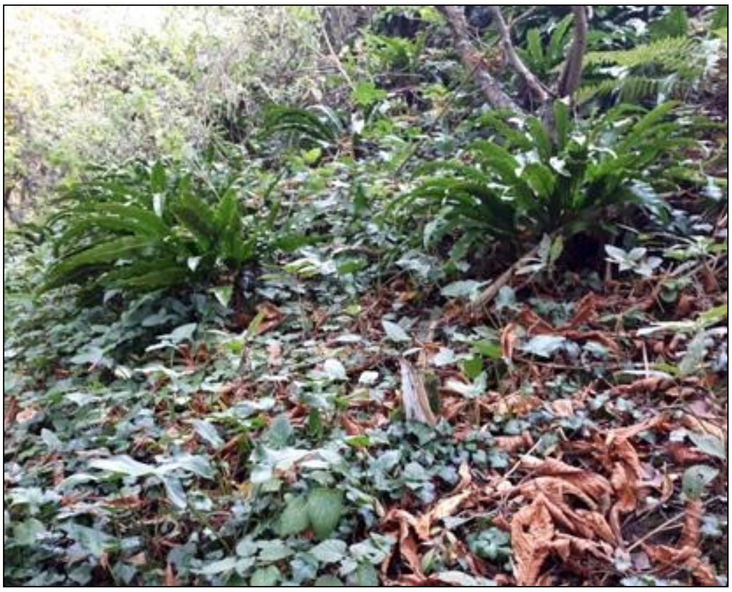
[46] T.R. Archer Briggs (1888). Arum italicum Mill. and A. maculatum Linn. *Journal of Botany* **26**: 378.

[47] C.T. Prime (1954). Arum neglectum (Towns.) Ridley. Biological Flora of the British Isles, *Journal of Ecology* **4**2: 241-248.

[48] C.T. Prime (1960). *Lords and Ladies*. Collins New Naturalist. London.

Field Club, led by D.A.C. Long, in May 1962[49], when they found the plants badly eaten by slugs; following this, the existence of the colony appears to have fallen out of sight.

The publication of the 1961 details in the county 'probably extinct' plant list in February 2018, as a result of the appearance of the relevant part of Francis Rose's manuscript Flora, afforded the key to re-establishing the status of the plant in Kent. The optimum time for identifying *A. italicum* is October/November, as its leaves are fully expanded and *A. maculatum* does not normally flush until early spring. The site was investigated by Stephen Lemon on 9 November 2018 and the *Arum* was found to be still present. It was recorded at a wooded stretch of the Brockhill Stream, opposite the south eastern corner of the lake, TR 14705 35756 to TR 14707 35767. Plants were confined within a 30 metre stretch of the eastern bank of the stream, roughly between two weirs. They occupied a shallow sheltered slope a few metres wide between the stream edge and a much steeper slope that ascends above the tree cover into the scrubby pasture above. There were many plants displaying fully developed leaves, including at least two clonal patches a few metres wide and several smaller patches and isolated plants, with some plants further up the slope into the bramble cover. A few plants were seen along the scrubby edge of the stream immediately below the downstream weir where the stream flows over the Victorian 'cascade', but no plants were detected anywhere along the landscaped western side of the stream or for 200 metres upstream or downstream of the colony.



Saltwood, slope base habitat. Photo by Stephen Lemon, 9 November 2018

Associated species in the immediate vicinity included *Hedera helix* agg. (Ivy), *Asplenium scolopendrium* (Hart's-tongue), *Polystichum setiferum* (Soft Shield-fern), *Urtica dioica* (Common Nettle), *Clematis vitalba* (Traveller's-joy), *Sambucus nigra* (Elder), *Aesculus hippocastanum* (Horse-chestnut), *Alnus glutinosa* (Alder), *Mercurialis perennis* (Dog's Mercury), *Rubus fruticosus* agg. (Bramble), *Ulmus glabra* (Wych Elm) and *Veronica montana* (Wood Speedwell). Calcicole bryophytes in the immediate area included *Rhynchostegiella tenella* (Tender Feather-moss) and *Oxyrrhynchium hians* (Swartz's Feather-moss) growing on ragstone, *Anomodon viticulosus* (Rambling Tail-moss) and *Taxiphyllum wissgrillii* (Depressed Feather-moss) growing on the weir.

The absence of other Kent native occurrences and the potential for Victorian tree- or shrub-plantings on the Brockhill Estate to have brought in the *Arum* are factors which cannot be ruled out in considering the status of this colony. The nearest unequivocal native populations are some 120km away. The Flora of Sussex (2018)[50] considers that its East Sussex status is as an introduction, and that native Sussex populations are only to be found west of the River Adur. There it occurs typically along the lower downland scarp in moist situations on springlines in woodland and in humid coombs (in the more eastern sites being on south-facing slopes); but is also locally frequent on calcareous Upper Greensand and can grow on gravels and brickearths on the coastal plains. The Saltwood site has similarities with humid coomb habitats and the Sussex calcareous Upper Greensand locations. Its soil is assumed to derive from a downwash of the Hythe Formation over the

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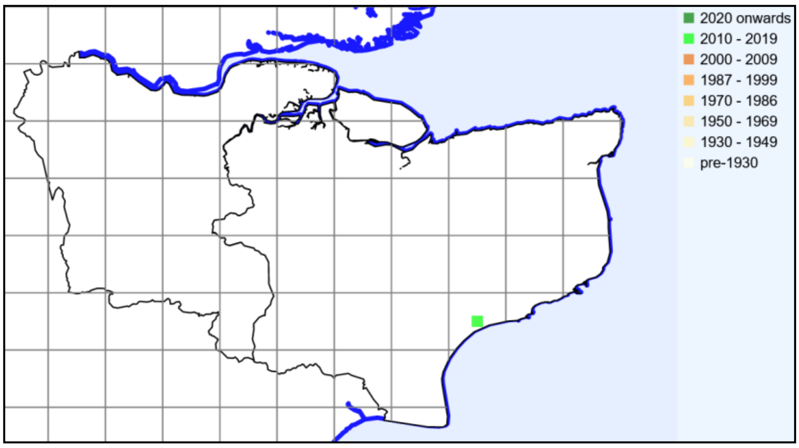
[49] D.A.C. Long (1963). May 20th – Sandling and Brockhill areas (field meeting report). *Bulletin of the Kent Field Club* **8**: 14-15.

[50] Abraham, F. et al., (2018). *Flora of Sussex*. Sussex Botanical Recording Society.

Atherfield Clay, with outcropping ragstone rocks present on the slope. The Sandgate Formation, referred to by Francis Rose, is above; all three geological formations being quite close together here. The base content of ragstone will be sufficient to afford some similarities to West Sussex habitats on chalk or other calcareous soils; and deep soils with high water content are recognised by C.T. Prime[51] as characteristic habitat requirements in south east England. So the Saltwood site is not an unfeasible native location, notwithstanding the counter-factors.



***Arum italicum* subsp. *neglectum* Kent records as at 2024 mapped at tetrad level, from BSBI database**

A. italicum is distinguishable from *A. maculatum* by its earlier leaf growth, and its leaves are 15-35cm long (7-20cm with *A. maculatum*) and the spathe is 15-40cm (10-25cm with *A. maculatum*). A purple spathe appendage indicates *A. maculatum*; a yellow one could be either species. The leaf veins and midrib of *A. maculatum* are more or less the same colour as the rest of the leaf. Those of *A. italicum* subsp. *neglectum* are paler. Those of *A. italicum* subsp. *italicum* are whitish, often vividly so, as with cv. 'Marmoratum' which is a fairly frequent garden escape.

The hybrid between *A. italicum* subsp. *italicum* and *A. maculatum* may be quite similar to *A. italicum* subsp. *neglectum;* but will normally be found in a mixed population, with hybridization having occurred in situ. But where an isolated intermediate occurs, it should be borne in mind that some cultivars are reputed to be hybrids between *A. maculatum* and either subspecies of *A. italicum*[52], in which case it is appropriate to consider, as well as the details of morphology, whether the location is one which has characteristics of a native site.

This account has benefited greatly from the investigations of Stephen Lemon.

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[51] C.T. Prime (1954), cited above.

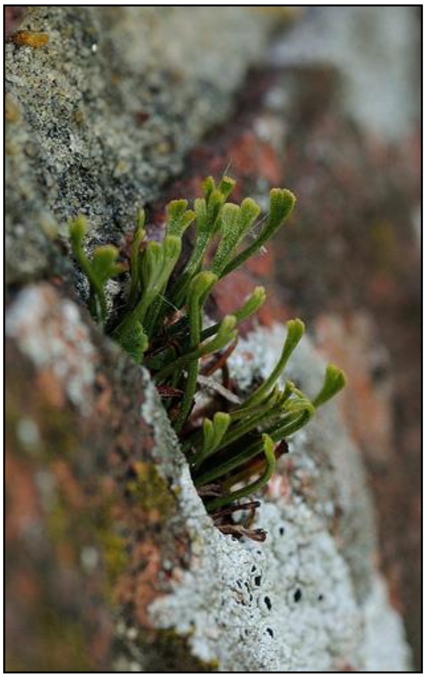
[52] Edwards, D. (2014). Notes from Wisley (v.c. 17): a brief discussion of putative hybrids between *Arum italicum* Mill. and *A. maculatum* L. and a request for plant material. *BSBI News* **126**: 35-36.

Asplenium septentrionale (L.) Hoffm. (Forked Spleenwort)

vc 15

Rarity / scarcity status

The British distribution of *Asplenium septentrionale* is largely confined to North Wales, the Lake District and Scotland. The small size of many populations, together with a decrease in their number in natural sites, is reflected in the fern's Great British status of **Near Threatened** and its English threat categorization of **Vulnerable**. In Kent, restricted to one site, it is **rare**.



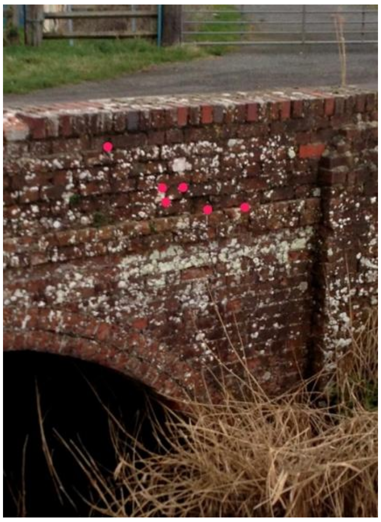
Brenzett. Photo by Lliam Rooney, 24 May 2011

Account

The species was found in Kent by L. Breda Burt, the record being published in Philp (1982) as "a fine clump". The number of plants present – and, indeed, the presence of the plant at all – has varied over the years. Population changes are described by Edgington (2008)[53]: Eric Philp found three plants after the initial discovery and then all disappeared in the 1980s after some hot summers. John Edgington's find in 2007 of six plants was published as a discovery of the species' reappearance. However, this was preceded by Owen Mountford having found three tufts, each of c. 4cm diameter, in August 2001. In July 2009, a visit by the British Pteridological Society (BPS) found plants looking very dead, although viewed with a hand lens some were still green at the centre; at least four plants were still present in April 2011 (Geoffrey Kitchener, Lliam Rooney) although only three were seen in May (Sue Buckingham, Lliam Rooney). There were still three in 2013 (Stephen Lemon), but the fern may not have shown in 2012. In November 2014, four plants showed for a BPS visit, albeit that most fronds were fairly brown at that time of year. Six were seen by Dominic Price in March 2017 and seven by Stephen Lemon in July. It appears, therefore, that the fern is subject to die-back and apparent disappearance for periods.

Subsequent records are:

- three plants in November 2018 (Dominic Price; ivy cleared back to avoid encroachment); also 2019, when showing drought stress; also 2020;
- four plants in July 2021 (Holly Stanworth).
- Two plants in May 2023 (Stephen Lemon), when *Parietaria judaica* (Pellitory-of-the-Wall) reducing potential growing areas for the fern.
- Three plants in October 2024 (Owen Leyshon), when encroaching ivy restrained.



Brenzett, location of six plants. Photo by Dominic Price, 8 March 2017

The location is Summerhouse Bridge at Ivychurch Road, a small roadbridge over a dyke (the New Sewer, a grave of several pteridologists' cameras) near Brenzett in Romney Marsh, at TR 00858 27169[54]. The fern is present on the unshaded south-east facing brickwork. This appears to provide a proxy for its "natural" sites on steep south-facing rocks, with exposure to direct sunlight and lack of water-logging. In its normal British range it shows a preference for acidic rock faces, mining spoil and unmortared walls. It is therefore surprising that its Kent habitat is a mortared brick face.

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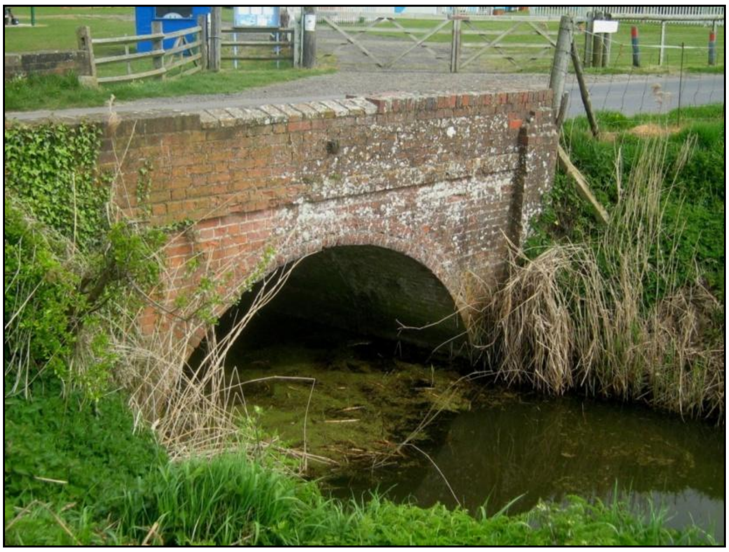
[53] *Asplenium septentrionale* in Kent – native or alien? *BSBI News* (2008) **107**: 16-18.

[54] Also recorded (same site) as TR 00864 27164.

The Kent colony is a remarkable anomaly in the distribution of *Asplenium septentrionale*, having regard to its limited presence in Great Britain, in the north west. There is no evidence of deliberate planting or spore sowing, although the *New Atlas of the British and Irish Flora*[55] treats its status here as alien, not native. Edgington (2008) points out that the nearest sites for this species are in France and Belgium, between 100km and 200km away, and that there is no reason to doubt that this is an example of natural spread through airborne spores. Since then, another anomalous sighting of this species has been made[56], in a central London basement, also on the mortar of a brick wall. This can scarcely be the source of the Brenzett colony.

Brenzett. Photo by Geoffrey Kitchener, 14 April 2011



Long distance spore dispersal is an entirely reasonable explanation for its spread. In consequence, one might also conclude that Hanbury and Marshall's rejection of Blackstone's record from Bocton (Boughton) church near Faversham (*Specimen Botanicum*, 1746) in favour of *Adiantium ruta-muraria* (Wall-rue) is not cut-and-dried, although it is an improbable record, in spite of Blackstone knowing *Adiantium ruta-muraria* well enough to record it separately.

There is, however, an alternative for Brenzett (although it would not serve to explain the central London sighting of this species as well). In the background of the habitat photo (above) can be seen the Brenzett Aeronautical Museum. Its buildings overlook the Brenzett (or Ivychurch) Advanced Landing Ground, which was constructed by the Air Ministry in 1942-43 and used to support the D-Day landings. In 2011 Geoffrey Kitchener and Lliam Rooney were informed by a local resident that as a result of these works and the wartime increased heavy vehicle use, the bridge was then reconstructed, using bricks from Scotland (where the normal range of distribution of the fern extends, and raising the possibility that spores may have travelled with the bricks). It was also said that the bricks were used locally for other structures, and that further colonies of the fern existed but would not be disclosed by the informant. This information has not yet been verified, but Stephen Lemon in 2013 was told by a local resident that the wartime bridge reconstruction involved the use of bricks from Wales (also within the normal range of the fern). Edgington (2008) was of the view that the bridge appears to be late Victorian. However, the parapet walls appear to have been re-built (Dorothy Beck, personal communication) as they are a different brick type from those below road level and are laid in a different bond.

Brenzett. Photo by Lliam Rooney, 24 May 2011

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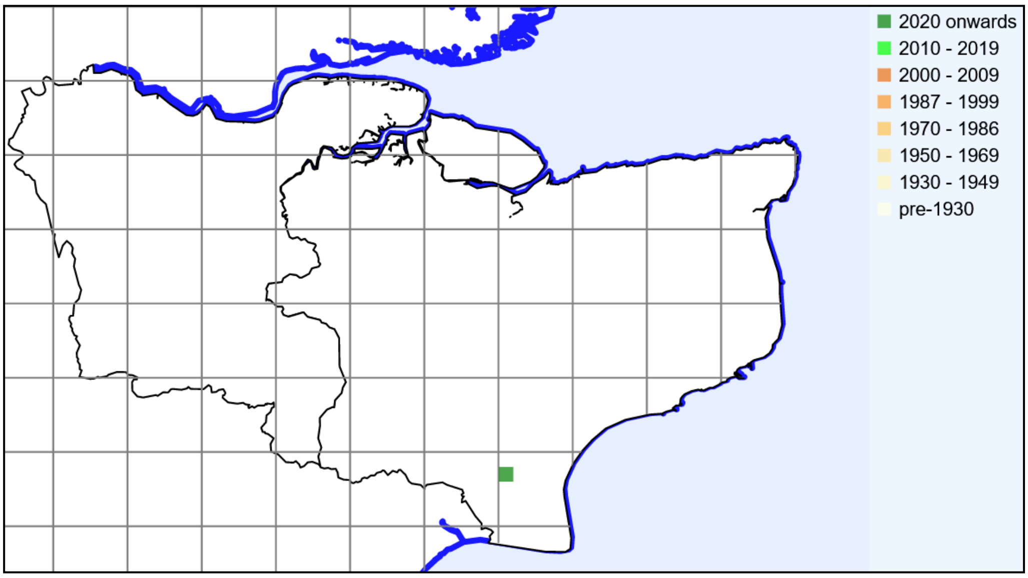
[55] ed. Preston, C.D., Pearman D.A. & Dines, T.D., 2002.

[56] Ripley, P. (2012). Regional meetings: South-East: Central London – 9 July (Leader: John Edgington). *British Pteridological Society Bulletin for 2011*, 7(4): 334-337.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Asplenium septentrionale **Kent records as at 2024 mapped at tetrad level, from BSBI database**

Kent Rare Plant Register

Species accounts Part B

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date:May 2025

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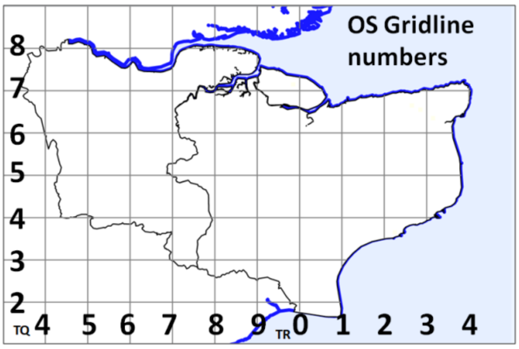
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



See the Kent webpage of the BSBI website at https://bsbi.org/kent for:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- the 'probably extinct' rare plant list
- how the register was put together.

Abbreviations used in the text:

Recorders' initials:

ACH Andrew Henderson
AG Alfred Gay
AL Alex Lockton
BB Brian Banks
BH Bethany Hadfield
BW Brian Woodhams
CEC Carter Ecological Consultants
CO Colin Osborne
CS Cath Shellswell
DC David Carder
DCh Danny Chesterman
DG Doug Grant
EGP Eric Philp
DM Daphne Mills
FB Fred Booth
FJH F.J. Hanbury
FR Francis Rose
GD George Dowker
GK Geoffrey Kitchener
HS Holly Stanworth
JM Joumana Mobarak
JP Joyce Pitt
JRP John Palmer
KC Kate Chandler
KFC Kent Field Club
LR Lliam Rooney
LWD L.W. Dillwyn
MG Margot Godfrey
MP Mike Phillips
OL Owen Leyshon
PH Peter Heathcote
RC Ray Clarke
RG Bob Gomes
RH Robin Hanson
RM Richard Moyse
RMB Rodney Burton
RoF Rosemary FitzGerald
SB Sue Buckingham
SK Sarah Kitchener
SL Stephen Lemon
SP Sue Poyser
TI Tim Inskipp

Other abbreviations and references:

BM = Natural History Museum herbarium	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MNE = Maidstone Museum Herbarium	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
Hanbury & Marshall (1899) refers to their *Flora of Kent*	NNR = National Nature Reserve	

Baldellia ranunculoides (L.) Parl. (Lesser Water-plantain)

vc15; gone from vc 16

Rarity / scarcity status

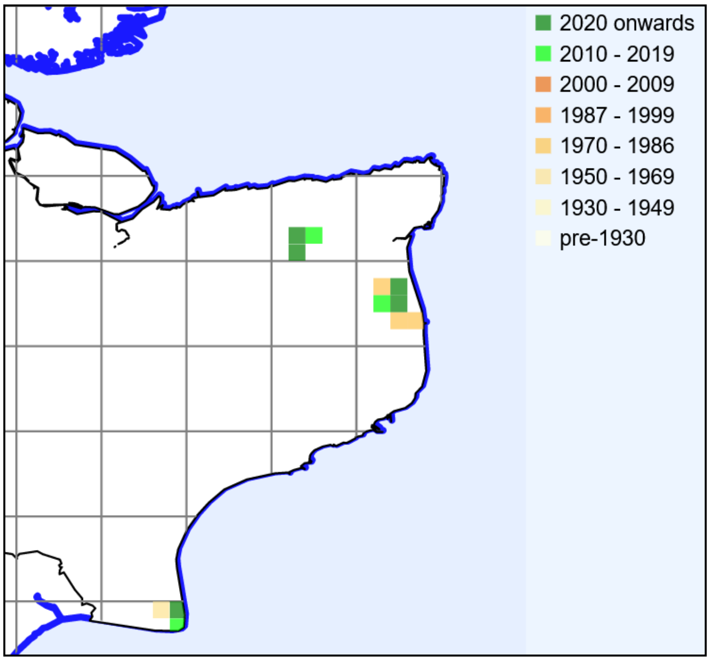
In Great Britain, *Baldellia ranunculoides* subsp. *ranunculoides* is considered to be **Near Threatened**, with British population trends showing some decline, although there are stable populations in the west. In England, however, it is regarded as **Vulnerable** to the threat of extinction. Its Kentish status ranks as locally **scarce**, confined to East Kent, and it is treated as a county axiophyte, indicative of good habitat.

Long Pits, Dungeness. Photo by Lliam Rooney, 12 July 2011

Account

Thomas Johnson's revision (1633) of Gerard's *Herball* refers to this species as in a ditch near Margate, the first Kentish record (and, indeed, the first localised record for the British Isles). Whilst there are historic records across the county, those in West Kent (from being described as "frequent" in boggy places in Edward Jenner's *Flora of Tunbridge Wells*, 1845) have declined to the last sighting, at Chislehurst Common, in 1954[57]. As regards East Kent, Marshall (in the Victoria History of the County of Kent, 1908) described it as "rare, except near Canterbury, Sandwich and Deal".

If one were to assess its status from Philp (1982, 2010), one might conclude that there is a trend of decline at local level which is comparable with the national long-term decline. Philp (1982) recorded it primarily in the Sandwich / Deal area, but also at Dungeness and Stodmarsh. However, there were three north east Kent tetrads (TR26F, TR35N, TR35R) where it could not be found in his subsequent survey (Philp, 2010), and overall gains and losses brought about a position in which the 1991-2005 survey showed presence in four tetrads, a net loss of one tetrad since 1971-80. This does not seem to be a 'real' decline at all, in that it has been found again at Stodmarsh, at times in quantity (although also capable of apparently vanishing in a dry season, such as summer 2015), and in East Kent overall, its 2010-24 presence amounts to eight tetrads (equivalent to 11 monads), i.e. more than in either the 1971-80 or 1991-2005 surveys.



***Baldellia ranunculoides* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Neither the 1971-80 nor 1991-2005 surveys should be regarded as fully comprehensive, however, not just because more records have emerged subsequently but also because these were general botanical surveys.

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[57] R. M. Burton (1983). *Flora of the London Area*. A 2002 record from the Greenwich Peninsula Ecological Park is assumed to have been introduced. A 1989 record for Holborough Marshes remains unconfirmed.

Where intensive ditch surveys have been carried out, as has been the case at Stodmarsh in 2022 and in the Hacklinge area in 1982 and 2003, then data have been much more comprehensive, not just in terms of tetrads/monads, but also the density of populations within those areas, given that ten-figure grid-referencing was used.

Long Pits, Dungeness. Photo by Lliam Rooney, 12 July 2011

It is a plant of unshaded pond, lake or ditch margins, particularly by brackish waters. The substrate may be peaty (Ham Fen), gravelly (Dungeness) or alluvium (Stodmarsh). Growth is encouraged where a degree of openness and limited competition is maintained. This may be through fluctuating water levels or exposure. However, management may also create these conditions, as has taken place at the Dungeness Long Pits. The population had been largely shaded out by *Salix*, except for a patch of marginal vegetation by the EDF Energy pump station. In 2009 some marginal *Salix* was cleared, with stump treatment and continuing clearance in 2010 resulting in the extended presence of *Baldellia* along some 400m of margin.

Long Pits, Dungeness. Photo by Owen Leyshon, 23 July 2011

The effect of management is also indicated by the appearance of the species in 2021-23 in bird scrapes near west of Great Wood, Worth Minnis, dug in 2019-20. Although it is possible for seed to have been brought in by birds, the speed and extent of colonisation would suggest that buried seed had been brought to the surface. (A similar cause is likely to have accounted for the quantity of associated *Potamogeton coloratus* (Fen Pondweed), also present in ditches dug at the same time.)

There are two British subspecies, of which subsp. *ranunculoides* (an erect, robust plant, with flowers about 15mm in diameter, 15-20 flowers per whorl) is the only one currently identified as present in the county (confirmed at Dungeness and Stodmarsh). In flower, it should not be mistakable for other British species; in leaf, care should be taken to differentiate from young leaves of other aquatics.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Long Pits, Dungeness	TR0817	SSSI	July / August 2011	LR, OL	TR 084 179: several recorders have visited this site, gravel pits dug in the 1920s. LR recorded on 12 July 2011 (1) about 15 plants at TR 08474 17908, at the extreme south end of the pits. Associated flora: *Alisma plantago-aquatica, Myriophyllum spicatum, Iris pseudacorus, Potamogeton trichoides*. (2) many plants at TR 08450 17995

					along western edge of the pits. Associated flora: *Ranunculus lingua* and *R. circinatus*. OL recorded on 1 August 2011 over 194 plants along 400m of the western margin of the Bottom (south) Long Pit, from TR 085 179 to TR 084 184. Associated flora: *Iris pseudacorus, Lythrum salicaria, Hydrocotyle vulgaris, Alisma plantago-aquatica, Mentha aquatica, Juncus articulatus, Carex pseudocyperus*. TI recorded on 3 July 2011 over 30 plants at the southern end of the south Long Pit, at TR 08483 17903. It has been known at Dungeness ponds at least as far back as 1867 (GD).
Long Pits, Dungeness	TR0818	SSSI	(1) 26 June 2022 (2) 10 June 2021 (3) 23 August 2013 (4) 20 August 2011	(1) KBRG / WFS meeting (2)CO (3)CO (4) SB	(1) By the southern Long pit at TR 0837 1818; and Southern Long Pit west side just north of pumping station. (2) Southern Long Pit west side just north of pumping station. (3) Plants noted on eastern side near top of South Long Pit. (4) About 100 plants over 15m of western margin at TR 08439 18042.
Stodmarsh	TR26F		(1) After 1970, before 1981	(1) Philp, 1982	(1) Recorded as TQ26F. Presence between Stodmarsh and Grove Ferry goes back to 1875 (FJH).
Stodmarsh / Upstreet	TR2262, TR2361, TR2362, TR2462	NNR, SSSI	(1) 16 June 2024 (2) 8 June 2023 (3) 11 July 2022 (4) 11 July 2022 (5) 5 July 2022 (6) 5 July 2022 (7) 1 July 2022 (8) 9 June 2022 (9) 24 July 2020 (10) 20 June 2019 (11) 13 August 2016 (12) 29 August 2014 (13) 17 August 2014 (14) 9 August 2014	(1) & (2) AL (3) AL, RH & BH (4) AL & BH (5) AL, HS & KC (6) AL & KC (7) AL & KC (8) AL (9) AL (10) to (14) AL & JM	(1) TR 2292 6213. Numerous plants along a recently-cleared ditch. (2) TR 2301 6207. (3) TR 2316 6186, Stodmarsh ditch survey. (4) TR 2333 6182, TR 2317 6193, TR 2307 6200, Stodmarsh, ditch survey. (5) TR 2286 6199, TR 2284 6220, ditch survey. (6) TR 2287 6219, ditch survey. *Baldellia ranunculoides* subsp. *ranunculoides* floating patch in the middle of the ditch. (7) TR22896196, ditch survey. (8) TR22986211, Stodmarsh. A couple of plants in flower. (9) Abundant (hundreds) in usual place in TR2362. (10) TQ 2394 6238, in S19C *Eleocharis palustris* swamp, *Agrostis stolonifera* subcommunity. Compartment 57. (11) A vast population of hundreds of plants occurs at TR 2402 6260 and TR 2395 6242 in S19 *Eleocharis palustris* swamp, the former in *Agrostis stolonifera* sub-community. (12) TR 2299 6210 and in S13 *Typha angustifolia* swamp at TR 2294 6215. (13) TR 2340 6232, one plant in lake in front of Harrison's Drove Hide. (14) TR 2328 6218, numerous plants in scrape in field; TR 2329 6217, a small patch in scrape in

					field. Reasonably abundant (ditch-sides and in rills) at TR 2328 6218, TR 2329 6217, TR 2340 6232, TR 2294 6215 & TR 2299 6210, but none seen in dry 2015 summer.
Ham Fen area	TR3354	KWT managed reserve and SSSI	(1) 13 July 2013 (2) After 1990, before 2006 (3) 29 June 2003	(1) KFC meeting (2) EGP (Philp, 2010) (3) RM	(1) Muddy pond margins of pony-grazed fen in scattered locations, e.g. TR 33659 54996, TR 33316 54897, TR 33310 54903. Associated species included *Juncus subdodulosus*, *Equisetum palustre*, *Lythrum salicaria*. (2) Recorded as TR35H. (3) TR3354. Also noted by JP, 7 June 1991, in a peaty area of the fen.
Ham Fen area	TR3355	KWT managed reserve and SSSI	13 July 2013	KFC meeting	Large population of plants alongside ditch at TR 33077 55208 and on bare wet peat in an adjacent area TR 3307 5520 which was dug out 10 years ago and grazed by Konik ponies the previous season. Known in ditches between Ham Ponds and Eastry at least back to 1801 (LWD).
Hacklinge Marshes area	TR35M		2006	EGP (Philp, 2010)	The location, by Roaring Gutter Dike, was explored by KBRG in July 2011. The banks of the dike have apparently been altered to improve flow, and the plant could not be found.
Hacklinge Marshes area	TR3454	SSSI	2 March 1983	ACH	TR 347 546.
Hacklinge Marshes area	TR3455, TR 3456	RSPB reserve and SSSI, at least in part. At time of Minnis Farm record, site was subject to management agreement for benefit of this plant.	(1) 12 August 2023 (2) 13 July 2022 (3) 22 June 2021 (4) 3 July 2020 (5) 5 September 2013 (6)Late 1990s - early 2000s (7) 2003 (8) 1982	(1) KFC meeting (2) SB (3) SB & SL (4) SB (5) GK, LR & RG (6) BB (7) CEC (8) ACH	(1) (a) TQ3456, RSPB Lydden Valley, at the margin of bird scrapes (compartments 44 & 45). (b) TQ3455, in good quantity at margin of bird scrape. (2) (a) A good number of plants on the margin of a pool on RSPB land at TR 342 557. None appeared this year in the nearby ditch. (b) Inside Great Wood at TR 34440 56033 many fruiting plants on dry bare cattle poached mud. (3) TR 3424 5602 and TR3424 5602, on RSPB land, frequent at margin of shallow pool / bird scrape excavated 2019. (4) (a) A few plants flowering at TR 3428 5576, the only area along the ditch with any open water and free of *Juncus subnodulosus.* (b) Around six flowering plants in ditch (usual place) at TR 3428 5576. (5) TR 34299 55742, a small patch at ditch margin in pasture amidst *Juncus* spp. Probably same as noted by SB on 24 July 2013 with *Juncus subnodulosus.* (6) TR 34348 55746 (also in TR35M, but a different site to the last). Frequent in a ditch to the north of a track bordering pasture fields at Minnis Farm. The ditch had a number of sluices installed to maintain water, because of the effect of mining subsidence. (7) TR 34236 55675 at ditch 119, TR

					34270 55620 at ditch 110, TR 34275 55782 at ditch 127, Hacklinge ditch survey (8) TR 34130 55940 at ditch 394; TR 34144 55643 at ditch 328; TR 34400 55818 at ditch 424; TR 34317 56186 at ditch 392, TR 34538 55598 at ditch 349, TR 34386 56260 at ditch 361, TR 34579 55517 at ditch 348, TR 34620 55652 at ditch 355, TR 34256 55285 at ditch 326, TR 34259 55574 at ditch 329, Hacklinge ditch survey
Hacklinge Marshes area	TR3553	SSSI in part	(1) 2 March 1983 (2) 1982	(1) ACH (2) ACH	(1) TR 358 532, isolated block of pasture and dykes on peat. (2) TR 35953 53217 at ditch 520, Hacklinge ditch survey.
Hacklinge Marshes area	TR3555	SSSI	(1) 2003 (2) 1982	(1) CEC (2) ACH	(1) TR 35760 55640, ditch 82, Hacklinge ditch survey. (2) TR 35110 55190 at ditch 312, TR 35760 55640, at ditch 79, Hacklinge ditch survey.
Sholden	TR3653	SSSI	1982	ACH	TR 36017 53190 at ditch 522, Hacklinge ditch survey.

Worth Minnis, bird scrape. Photo by Stephen Lemon, 22 June 2021

Bistorta officinalis Delarbre (*Persicaria bistorta* (L.) Samp.) (Common Bistort)

vc15 and 16

Rarity / scarcity status

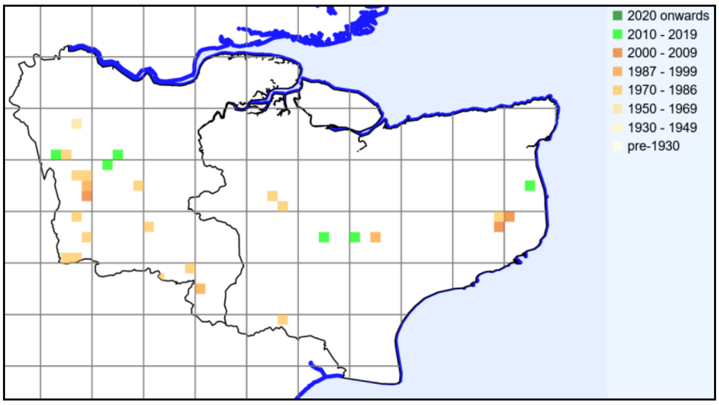
Common Bistort is widespread in the British Isles, but common only in north west England. Its threat status for conservation purposes is one of 'Least Concern' in both England and Great Britain as a whole. Whilst there have been scattered introductions, as a native plant it appears to be in decline in Kent and is **scarce**.

Otford, with Palace remains in the background. Photo by Geoffrey Kitchener, 12 May 2024

Account

The species is first mentioned for Kent in G.E. Smith's *Catalogue of rare or remarkable phaenogamous plants collected in South Kent* (1829) as 'Collected by Mr. William Fagg, in a field to the right upon Stonestreet, about eight miles from Hythe'. This looks likely to be somewhere around Sixmile between Stowting and Stelling Minnis; his informant was probably from Brabourne. Smith also mentioned the species in his manuscript notes (1830-33) as 'Nr Horton: by the river at Ashford' (these are probably two locations). Hanbury & Marshall (1899) regarded Common Bistort (which they called Snakeweed) as rather rare, in moist meadows and copses. The records which they had collated included some obviously damp areas as well as Smith's Ashford record: marshes at Minster and Monkton; between Furnace and Scarlett's millponds near Cowden; around the millponds, Tenterden; by the Royal Military Canal near Sandgate; and, less obviously, a field near Otford Castle, reported by Miss Worship. This last site is still extant, with a stream running through the field which is the site of 16th century Otford Palace. It is not impossible that this derives from a Tudor planting, especially as this was the location of the Palace's privy garden. The early herbalists Turner, Gerard and Parkinson (writing from a southern perspective, although Parkinson was born in Yorkshire) considered it very much a garden plant.

Francis Rose regarded it as rare, more so than formerly, but was still able to list occurrences in the 1940s-50s at Greenwich Park, Keston Mark, North Cray riverside, Shoreham (TQ 556 607), Ottinge, Waldershare, Brasted, Sundridge, Mariners, Harrietsham, Furnace Pond (Cowden), Bedgebury, Hook Green (Lamberhurst) and Frizley (Cranbrook), most of these explicitly in damp or wet areas.



***Bistorta officinalis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Philp (1982) assembled 18 tetrad records for 1971-80, mostly in the west and south west of the county. It was then regarded as rather rare in damp meadows and on roadsides. However, by the 1991-2005 survey of Philp (2010) it was even rarer, with a decline of 61% to seven tetrads, and the cluster in the south west (the earlier survey had five tetrad records in TQ44) no longer appearing. The position in relation to 2010-24 recording is even more concerning: there are only six records (both at tetrad and monad level). At least a couple are obviously planted or thrown out; and none is a continuation of a presumed native site.

Given the vigour of the clonal growth of this perennial where established, it is surprising that the species has undergone such decline in Kent. It may that damp meadow sites have been subject to 'improvement' and roadside sites, which may have represented introductions in any event, have been subject to works; but there is no clear evidence.

In flower it is not readily mistakable for other British species other, perhaps, than the terrestrial form of *Persicaria amphibia* (Amphibious Bistort) whose flowers have three stigmas (*Bistorta officinalis* has two), whose inflorescence is smaller and which often has black-blotched leaves.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Goathurst Common	TQ45W		30 May 2003	EGP & PH (Philp, 2010)	
Sundridge	TQ45X		1991-98	EGP (Philp, 2010)	
Downe (metropolitan vc16)	TQ4261		9 June 2014	JP & Botany Group	West Kent Golf Course north
Otford	TQ5259		(1) 31 May 2021 (2) 20 April 2011 (3) 1991-99 (4) 16 July 1994	(1) (2) GK (3) EGP (Philp, 2010) (4) Joint WFS / BSBI meeting	(1) Palace Meadow, location as in 2011, extensive and continuous in coarse sward although occasional flowers only. (2) Palace Meadow, abundant in dampish grassland between footpath and Sevenoaks Road, centred on TQ 52739 59158. And between the same footpath and a stream to the east, centred on TQ 52758 59140. Possible association with Tudor palace grounds. Usually cut back before flowering. (3) Given as TQ55J, and assumed to be TQ5259. (4) TQ 527 591.
Kemsing	TQ5560		3 June 2018	RMB	E side of Goodbury Road for 4-5 metres TQ 55661 60778 etc. (near Goodbury House).
Kilndown	TQ73C		1991-98	EGP (Philp, 2010)	
Little Chart Forstal	TQ9545		25 May 2010	GK	One plant at roadside, edge of Coldham Wood, TQ 95821 45877, presumed originating as throw-out.
Royal Military Canal, Lympne	TR0934		August 1985	JP	TR 094 344.
Ashford	TR0045		7 June 2018	SB	Two very large patches at margin of fishing lake, presumably planted TR 0022 4510.
Nacolt	TR04M		1991-99	EGP (Philp, 2010)	
Waldershare Park	TR24Y		30 May 2002	EGP & PH (Philp, 2010)	
East Studdal	TR34E		25 July 2000	EGP (Philp, 2010)	
Worth – Lydden valley	TR3555	SSSI	9 July 2018	DCh	TR 35151 55286, bank of drainage channel.

Blitum bonus henricus (L.) Rchb. (*Chenopodium bonus-henricus* L.) (Good-King-Henry)

vc 15 and 16

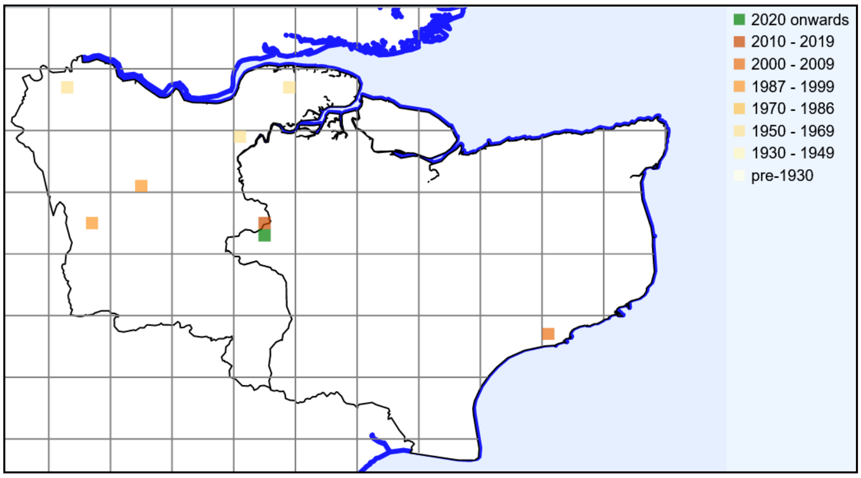
Rarity / scarcity status

Good-King-Henry is an archaeophyte, or ancient introduction (at least from Roman times), formerly grown for its edible spinach-like leaves, and widespread in the British Isles. It is, however, in decline, perhaps in consequence of being more rarely introduced, and so no longer recruiting the stock of escaped or established plants; and it is accordingly regarded as a **Vulnerable** species both in England and in Great Britain as a whole. In Kent, it is **rare**.

Loose. Photo by Stephen Lemon, 24 August 2022

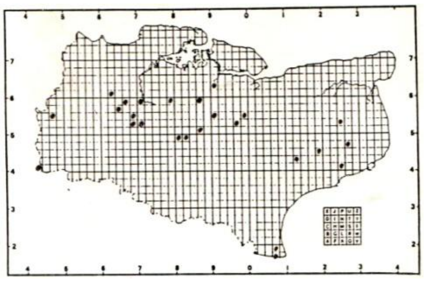
Account

The first record of *Blitum bonus-henricus* in the wild in Kent was made by Thomas Johnson in his *Descriptio Itineris* (1632), on Thanet between Nash and Queakes (Quex). Hanbury & Marshall (1899) gave no other specific records, but regarded it as not uncommon throughout the county, on roadsides and waste ground. It is not a plant which seems to have attracted much recording attention in Kent, but Francis Rose (in his manuscript Flora of Kent) had records for 26 out of the 52 Kent hectads) and Philp (1982) gave it as present in 25 scattered tetrads on roadsides and waste places, usually near farms or other buildings. By the time of the 1991-2005 survey (Philp, 2010) only three tetrad records were noted in the administrative county, so that its continuance appears more vulnerable in Kent than in most counties. There appears to have been only two non-garden records in recent years, at Maidstone and Tovil.



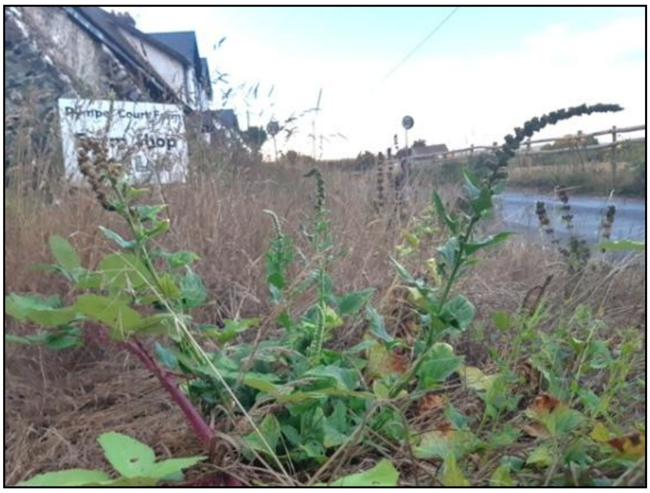
Blitum bonus-henricus **Kent records to 2024 mapped at tetrad level, from BSBI database.**

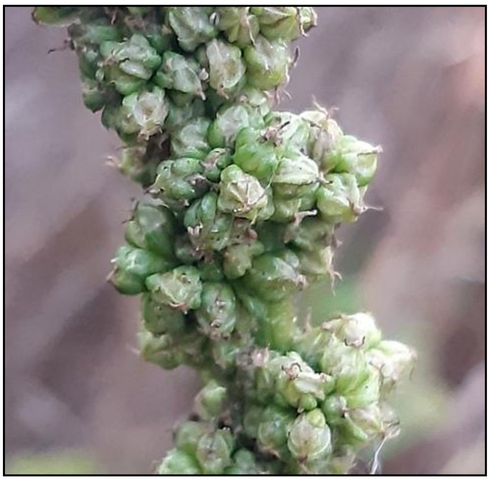
Whilst a map is given here of the historic distribution of the species, this does not show fully its widespread occurrence as late as the 1970s. This is because the BSBI database lacks records from Philp (1982) which gave a total of 25 tetrads but omitted to map them. These records are given here separately, in a map taken from Eric Philp's papers.



Blitum bonus-henricus **Kent records 1971-80 mapped at tetrad level.**

Blitum bonus-henricus is a patch-forming perennial which is capable of long persistence and appears not easily eradicated, so that it may well have continued for some time in locations where originally a cottagers' pot-herb. But its decline in recent times, is perhaps more rapid than might be expected, even given that it is little-grown and so that the opportunities for recruitment are no longer there. Its frequent proximity to farm or other old buildings suggests that its status may often be no more than established from planting. Although broadly recorded in Great Britain, there is a gap in the extreme south east, particularly for Kent and Sussex and it has been claimed to be a cold winter archaeophyte[58], so this may perhaps impact on its Kent suitability. It responds to cultivation in Kent and, indeed self-seeds in the author's garden, but in an adjacent gravel path, rather than the plant border.





Loose. Photos by Stephen Lemon, 24 August 2022

It is not particularly similar to *Atriplex prostrata* (Spear-leaved Orache), but the coincidence of their triangular leaves as shown in some identification books has led to mis-identifications.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Brasted	TQ45S		After 1990, before 2006	Philp, 2010	Road near church; presumably the same as RC's record, 1957, at TQ 468 554. [Not seen when sought in June 2012, GK.]
Romney Street	TQ56K		After 1990, before 2006	Philp, 2010	Same as Rose Cottage Farm, Magpie Bottom, TQ 545 609, where established by barn (originally planted?).
Tovil	TQ7453		10 July 2019	BW	Building site, the former Tovil tip.
Loose	TQ7552		14 August 2022	SL	Loose, Pimp's Court, TQ75415275. Wide scrubby road verge long edge of stone farm building. Single large flowering plant.
Maidstone	TQ7554, 7555		(1) 5 July 2017 (2) 30 June 2017	(1) & (2) BW	(1) TQ 751 549, disturbed ground around new railway footbridge. (2) TQ 754 550, garden weed.
Bredhurst	TQ7962		Summer 1998		c. TQ 795 622, lane by pub (the Bell). Marked on copy of FR's site notes for Flora of Kent. [Not found, GK, June 2016. Was near large house to west, but boundary now covered with *Symphytum orientale*.]
Folkestone	TR23D		19 August 2000	Philp, 2010	Location may have been along coast road.

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[58] Stace, C.A. and Crawley, M.J. (2015). P.430, *Alien Plants*. William Collins, New Naturalist.

Brassica oleracea L. var. *oleracea* (Wild Cabbage)

vc 15; never more than casual in vc 16.

Rarity / scarcity status

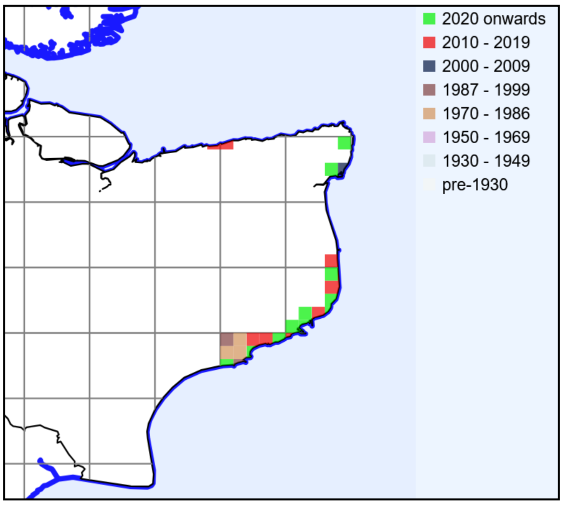
Wild Cabbage is **nationally scarce**, being present on maritime cliffs, generally calcareous, around Great Britain, mostly along the south coast. Its continued survival is not regarded as being under any particular threat. In Kent, there are well-established populations of long standing from Folkestone through to Deal, with outliers on Thanet, and it has no special scarcity status, although treated as a Kent axiophyte, indicative of good habitat.

Photo by White Cliffs Countryside Project

Account

William Turner, in his *Names of Herbes* (1548), said of this plant that it "groweth in Dover cliffes where I have onely seene it in al my lyfe. It may be named in english sea cole". (That is, what Turner called the sea version of "colewurtes, cole or keele"; but not, it appears, equated with Sea-kale; in his *A New Herball* of 1551 he named Wild Cabbage differently as ' Douer cole: because I found it fyrst beside Douer') The 1548 publication of its presence at Dover, where it still grows, is the earliest record for this species in the British Isles, and the East Kent population has the best claim for native status. It has been pointed out[59] that elsewhere in the British Isles many occurrences have been ephemeral, often in proximity to towns and villages, and most extant populations seem to have originated from cultivation. It has also been suggested that the species is a Roman introduction, although if this suggestion is applied to the East Kent populations, it raises a question as to the status of the corresponding occurrences on the French chalk cliffs of the channel coast.

Hanbury & Marshall considered it probably indigenous from Walmer to Folkestone. Within this range, plus an outlier on the Thanet chalk cliffs, Philp (1982) recorded it in 20 tetrads; Philp (2010) gave it as 19, remarking that the population remains much the same as it has ever been save for some losses through development. Our 2010-23 records amount to 20 tetrads (27 monads), although there are records within the traditional range that were made as plain *Brassica oleracea* rather than *Brassica oleracea* var. *oleracea.*



***Brassica oleracea* var. *oleracea* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Cabbage has been recorded as a casual in many places in Kent, clearly of cultivated origins, and there have been coastal occurrences of *B. oleracea* which do not fit into the maritime cliff habitat pattern (such as the recording of a small group on shingle at Lade, Dungeness, TR0721, in 2013) and which are best not treated as part of the putative native distribution. However, there has been some inland presence where the downs scarp leaves the coast around Folkestone (Sugarloaf Hill, Castle Hill).

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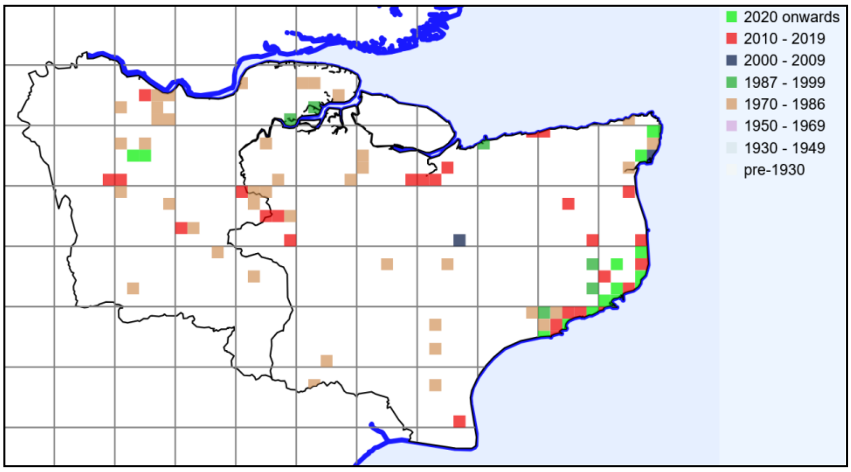
[59] N.D. Mitchel (1976)l, The Status of *Brassica oleracea* L. subsp. *oleracea* (Wild Cabbage) in the British Isles. *Watsonia* **11**: 97-103.

The following distribution map shows at tetrad level everything recorded under *B. oleracea*, whether true Wild Cabbage or any of the cultivated variants.



Brassica oleracea **Kent records to 2024 mapped at tetrad level, from BSBI database**

Wild Cabbage is a perennial, whose age may be identified from the annual groups of leaf-scars as the plant's trunk grows taller, but it can be susceptible to hard winters. Spread is by abundant seed, 16-32 per pod, maturing in September and dispersed generally by the plant being battered by wind, perhaps in some cases aided by birds. A study of spread from individuals at South Foreland showed a clumped distribution, with a peak at 8m x 8m, suggesting that this was the area of dispersal from a plant above.[60] The main burst of germination is in October. Typically, Wild Cabbage may be found on bare or near-bare chalk on or beneath cliffs; but it may also be found on inland chalk exposures within sight of the sea, although, inland, young seedlings are likely to be suppressed by competing vegetation. Seedlings appear to root directly into the chalk, without humus, rapidly developing a deep tap-root and a root system which penetrates deeply into any cracks, eventually becoming very woody, as does the stem.

While it may be the only species growing on a chalk cliff face, it also characterises the *Brassica oleracea* maritime cliff-edge community (MC4)[61], which generally has an irregular grassy cover of *Festuca rubra* and some *Dactylis glomerata*, with prominent *B. oleracea* and a little *Daucus carota* subsp. *gummifer*. The community is one of crumbling edges and sloping edges of south-facing calcareous cliffs, spanning splash zone to cliff top. Its soils are usually shallow and dry, immature because crumbling away, but perhaps enriched by sea-bird droppings.

Samphire Hoe. Photo by Sue Buckingham, 28 April 2009

Studies of Abbot's Cliff near Folkestone have shown that, whether within the wave splash community (just above normal high tide mark with abundant chalk boulders) or on the cliff ledges, screes, faces and falls, *B. oleracea* frequents saline areas, but not those of high salinity such as are dominated by halophytes[62]

A further plant association is noted by Francis Rose in a comparative study, *Botany on Two Coasts* (*New Scientist*, 15 July 1965, pp.158-161). He describes the combination of Wild Cabbage together with *Limonium binervosum* (Rock Sea-Lavender) *and Crithmum maritimum* (Rock Samphire), along much of the East Kent coastal cliffs. This contrasts with the corresponding French cliffs, which have some *B. oleracea*, but little else by way of cliff face vegetation, being kept sheer and bare through erosion from exposure to the south-westerly up-channel gales (and also having a less hospitable microclimate, being north to north-west facing).

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[60] Mitchell, N.D. & Richards, A .J. (1979). Brassica oleracea L. ssp. oleracea (*B. sylvestris* (L.) Miller): Biological Flora of the British Isles. *Journal of Ecology* **67**: 1087-1096.

[61] *British Plant Communities*, vol. 5, ed. J.S. Rodwell (2000). Cambridge University Press, Cambridge.

[62] C.P. Burnham, A. Gordon & P. Buckley (2011): Salinity on chalk cliffs and its influence on maritime vegetation, *New Journal of Botany* **1**:116-126).

B. oleracea may also be found in less specific plant communities, growing clustered on banks or against hedges or shrubs where patches of bare ground may occur, particularly within 150m or so inland of the cliff line. It may be that this is a consequence of wind hurling seed inland from cliff tops.

There is potential for the native populations to be affected by genetic content from neighbouring cultivation of *Brassica napus* subsp. *oleifera* (Oil-seed Rape). A study (Ford et al., 2006[63]) of coastal *B. oleracea* material collected in the White Cliffs area in June 2004 within 1-25m of arable field margins identified amongst 842 samples one *B. oleracea* × *B. napus* F_1 hybrid (Hope Point, TR 377 460), together with evidence amongst the other samples suggesting further introgression of Oil-seed Rape into the wild *B. oleracea* population. (This study also has wider implications for the risks of gene flow where genetically modified crops are grown.)

Samphire Hoe. Photo by David Steere, 15 May 2015

Wild Cabbage is supposed to be edible, both raw (the young parts only) and cooked. This is not necessarily to be recommended, both on the grounds that this is a nationally scarce taxon, and because the flavour is apparently somewhat 'strong' in comparison with cultivars; but Vera Day (1965)[64] noted having been told that, after a hard winter, when there was a great shortage of green stuff, the railwaymen in Folkestone Warren have gathered the Wild Cabbages and sold them to Dover greengrocers as 'Cliff Greens'; the greens were, the railwaymen said, 'quite nice if boiled twice'.

Samphire Hoe, habitat. Photo by David Steere, 16 April 2014

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[63] Ford, C.A., Allainguillaume, J., Grilli-Chantler, P., Cuccato, G., Allender, C.J., Wilkinson, M.J. (2006. *Proceedings of The Royal Society B*, **273**:3111-3115

[64] Day, V.J. (1965). Notes on *Brassica oleracea*. *Kent Field Club Transactions* 3(1): 1-3.

Briza media L. (Quaking-grass)

vc 15 and 16.

Rarity / scarcity status

Quaking-grass is a perennial locally common in the British Isles other than in north and north west Scotland, Cornwall and parts of Ireland. In Great Britain as a whole, the risk of extinction is regarded as of 'Least Concern'. However, in England there is some evidence of decline, and it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 25% in the likelihood of recording the species. In Kent, it is neither rare nor scarce but, comparing the periods 1971-1980 and 1991-2005, Philp (2010) shows a decline in tetrad records of 34% over those given in Philp (1982), although subsequent recording suggests that the decline has not been quite so substantial. It is regarded as a Kent axiophyte, an indicator of good habitat.

Queendown Warren. Photo by Lliam Rooney, 18 June 2010

Account

The first published record for Kent was made in Thomas Johnson's *Iter Plantarum* (1629). He came across the grass near the highway from Gillingham towards the Isle of Sheppey, on 14 July of that year. The species, being common, was not included in early botanists' accounts of rarities, nor was it necessarily remarked upon as part of chalk grassland flora, as we might expect. Thomas Forster's *Flora Tonbrigensis* (1816) refers *to Briza media* as 'In fields and meadows very common, particularly on Mount Sion, Tonbridge Wells' (a sandy location). Daniel Cooper, in his *Flora Metropolitana* (1836), noted it at Keston Mark or Common amongst various calcifuge species reflecting the sandy/gravelly terrain.

Hanbury & Marshall (1899) considered Quaking-grass to be so common throughout the county on downs and in meadows, etc. that it was not worth enumerating any records, other than its first discovery and a curious form with white spikelets. Near contemporaneous with this account are the *Woolwich Surveys*[65], which referred to the grass as common in badly drained meadows and pastures, but of no agricultural value. Again, the *Surveys* locate the grass at Keston Common, but also at Hayes Common and on grassy chalk banks about Down (sic) – so there is recognition of the ability of the grass to accommodate itself to both acid and calcareous grasslands.

Neutral meadow habitat, Lamberhurst Quarter. Photo by Geoffrey Kitchener, 13 June 2015

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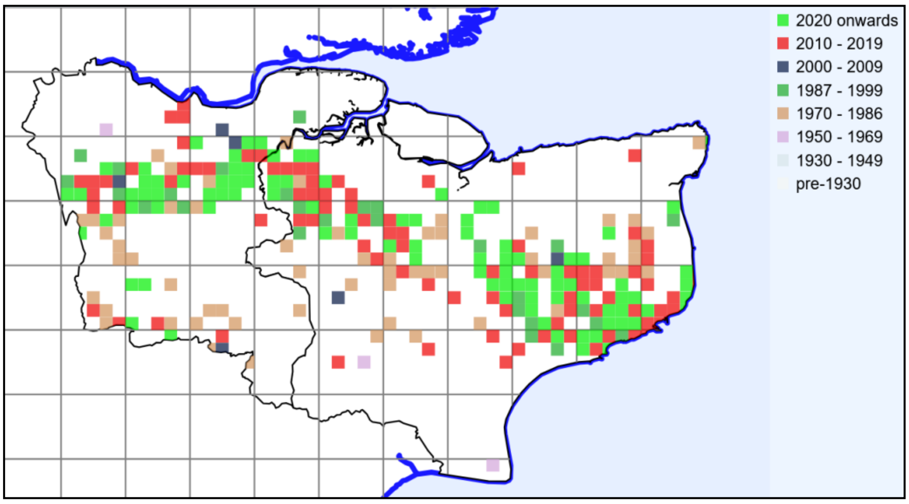
[65] *A survey and record of Woolwich and West Kent* (1909), general editors Grinling, C.H., Ingram, T.A. & Polkinghorne, B.C.

Philp (1982) found the grass still to be locally common, on downland and in meadows, particularly on the chalk. It was present in 181 tetrads in the administrative county. In Philp (2010), the grass is referred to as present on unimproved grassland on well-drained soils, particularly on the chalk, but then only found in 119 tetrads. It is apparent that the 1991-2005 survey identifies the grass as much more strictly confined to the chalk than as shown in the 1971-80 survey; in particular it suggests that there has been a considerable loss of Wealden records. Nevertheless, our 2010-24 records, albeit still sparse in the Weald, amounted to 182 tetrads (270 monads) across the county, so a major decline overall is not substantiated. This remains the case, even when one disregards eight metropolitan north west Kent records, because Philp (1982 and 2010) did not cover this area.

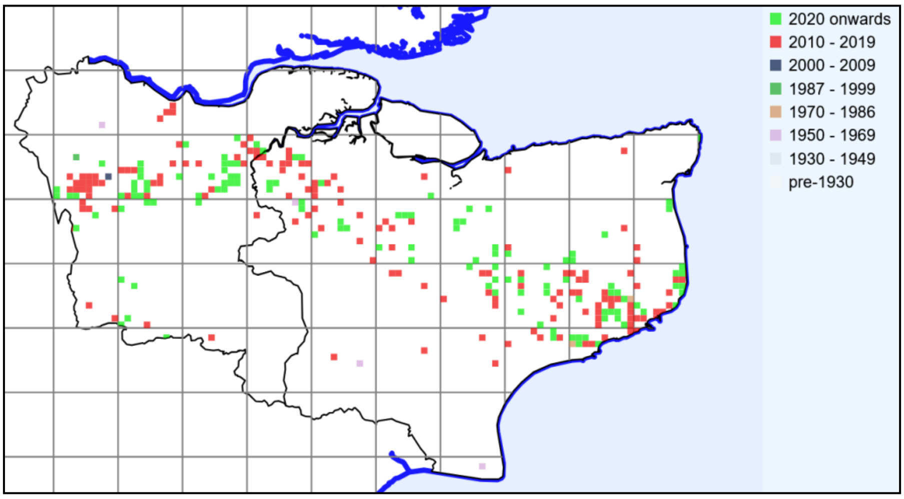


Briza media **Kent records to 2024 mapped at tetrad level, from BSBI database**

Where 1971-80 survey records have not been re-found, this is likely on the chalk to be the result of scrubbing over of downland; and in the Weald to be the result of loss of unimproved grassland through cultivation or re-seeding.

For the purposes of this register, Quaking Grass records are given below at monad level. The number of pre-2010 records is very few, as recording was then normally undertaken at a lower level of resolution. The records for 2010 onwards confirm clearly enough the preference of *Briza media* for a chalk substrate, and also its occasional appearance elsewhere. There have been a couple of anomalous records associated with the high speed railway which suggest origins from possible sowing.

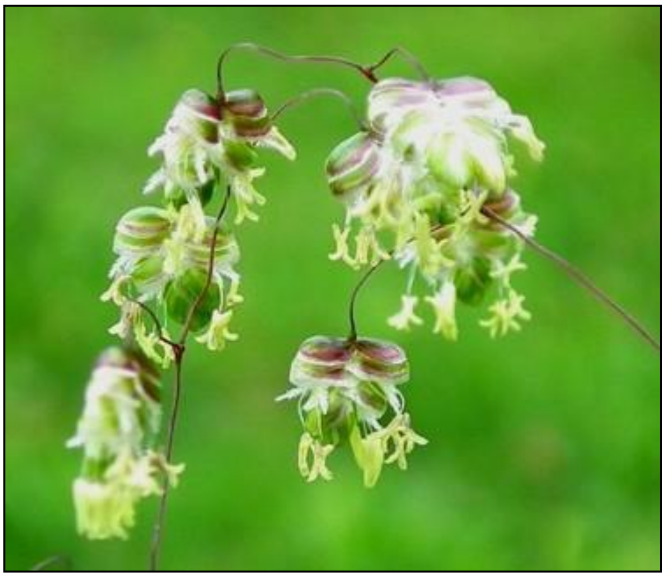
Briza media **Kent records to 2024 mapped at monad level, from BSBI database**



The typical appearance of *Briza media* is of a scattering of culms through nutrient-poor unshaded grassland. It spreads by seed, which germinates rapidly in vegetation gaps after release in late summer and autumn without forming a residual seed-bank. Vegetative spread also takes place via rhizomes, but it does not form pure stands, and any clumping as tussocks appears to be limited. It is low-growing and tolerant of grazing and, to a degree, tolerant also of trampling and waterlogging. Its growth on well-drained chalk substrates, in spite of having a fairly short root structure with limited ability to deal with summer drought, is aided by producing most of leaves by the end of April. Loss of the species may be due to the accumulation of leaf litter and through grassland becoming dense and coarse through lack of grazing (*Briza* *media* is a poor competitor); through re-seeding for agricultural 'improvement'; or conversion from grassland to arable.[66]

Queendown Warren habitat, chalk grassland with *Rhinanthus* minor (Yellow-rattle). Photo by Lliam Rooney, 18 June 2010

In flower, it is not readily mistakable. We do not have *Briza minor* (Lesser Quaking-grass) in Kent and the ornamental *Briza maxima* (Greater Quaking-grass) is a garden escape of streets, so its habitat does not coincide.



Magpie Bottom. Photo by David Steere, 1 June 2014

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[66] Ecological information has largely been taken from:
(1) Grime, J.P., Hodgson J.G. & Hunt, R. (1988). Comparative Plant Ecology, London
(2) Dixon, J.M. (2002). Briza media L. *Journal of Ecology* **90**: 737-752.

Bromus hordeaceus L. subsp. *thominei* (Hardouin) Braun-Blanq. (Coastal Soft-brome)

vc 15, now apparently gone from vc 16

Rarity / scarcity status

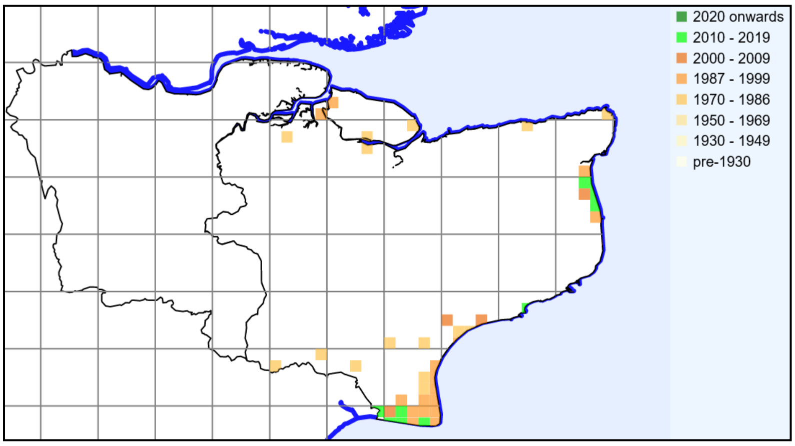
Bromus hordeaceus subsp. *thominei* has now apparently gone from West Kent (vc16), but it might still be worth searching the south beach at Grain, from which Francis Rose took material in 1955 (**MNE**), although coastal works have changed the terrain. It is regarded as **nationally scarce**, but is widely scattered around British coasts and is not regarded as being subject to any particular threat. In Kent, it is well represented in the Sandwich and Dungeness areas and is not rare or scarce.

Account

This subspecies was not separately recorded in Hanbury & Marshall (1899), and presumably it was passed over as part of the range of variation of the species. Specimens in **MNE** go back to 1953, predominantly from the Sandwich dunes or from sandy or shingly ground at and around the coast in the south east of the county (Dungeness / Lydd / Greatstone / Littlestone). Francis Rose's manuscript *Flora of Kent* includes a number of inland records, especially from the 1940s and 1950s; but it seems likely that these were *Bromus* x *pseudothominei* (Lesser Soft-brome), a taxon which was not separated until 1968, although question has since arisen as to whether it is of hybrid origin.

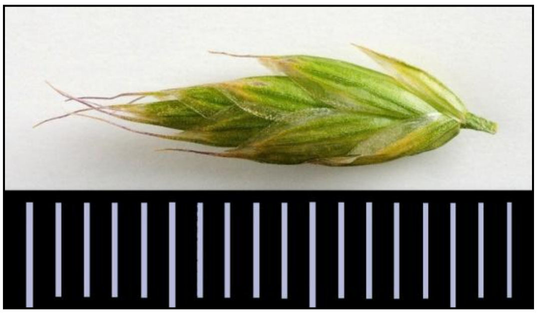
Sandwich. Photo by Lliam Rooney, 9 June 2015

The first reasonably trustworthy records for Coastal Soft-brome are given by Philp (1982), when 34 tetrad records were made, on sand-dune or waste sandy areas on or near the coast. Even so, it is possible that some of the inland Romney Marsh and Rother Levels records made then (e.g. TR03A, TR03Q, TQ92N, TQ82Z, TQ82D) were actually *Bromus* x *pseudothominei*, which has been found in comparable areas. This also applies to some of the north Kent locations. Philp (2010) gives a more compact coastal distribution, with 26 tetrads, from Dungeness to Hythe, from Deal to Sandwich and at Sheppey.



***Bromus hordeaceus* subsp. *thominei* Kent records to 2024 mapped at tetrad level, from BSBI database (includes doubtful inland records)**

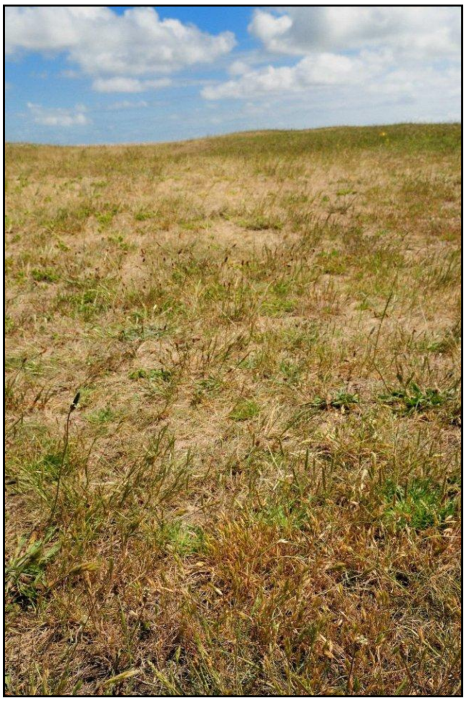
It will be seen from the accompanying tetrad distribution map that we have re-found only a minority of these sites. Indeed, 2010-24 records amount to ten tetrads (11 monads). The areas where records in Philp (2010) have not been re-found (e.g. Littlestone / Greatstone / Dymchurch / Hythe) are otherwise mostly well-recorded and do appear to have suffered any particular vicissitudes. It is unlikely that habitat changes are responsible for loss, as this diminution is not reflected in records of other species of Kentish coastal sand generally. The most likely conclusion is that it is currently being overlooked. We do not even have records for the current BSBI date class 2020-29.



Sandwich specimen. Photo by Lliam Rooney, 10 June 2015

Coastal Soft-brome is generally a small plant, with culms no longer than 8(12)cm and characteristically beginning as procumbent and then ascending. Its panicles do not exceed 3cm with few, erect spikelets. The lemmas are (6) 9.5-7.5cm long and are said[67] to be "glabrous (usually) or hairy". The hairy form seems to be more frequently encountered in Kent. However, the glabrous form has been found at Dungeness, Sandwich Bay and Greatstone, although both forms have appeared at the first two localities. It can be present in large numbers on the Kentish sand-dunes and this characteristic habitat may have encouraged selection to produce this ecotype of *Bromus hordeaceus*, recognized at subspecific level, although Cope & Gray (2009[68]) say that this recognition probably exaggerates the importance of the taxon. It may also be found on shingle or shelly sand, and as a component of fairly open turf on shingle.

Sandwich. Photo by Lliam Rooney, 9 June 2015



Sandwich, habitat. Photo by Lliam Rooney, 9 June 2015

Site	Grid reference	Site status	Last record date	Recorder	Comments
Lydd Ranges	TQ9918	MoD land, SSSI	7 August 2012	OL, GK, SB & TI	Near Outlands Cottage TQ 999 185.

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[67] C. Stace (2010). *New Flora of the British Isles*, 3rd edition.

[68] Cope, T. & Gray, A. (2009). *Grasses of the British Isles.* Botanical Society of the British Isles, London.

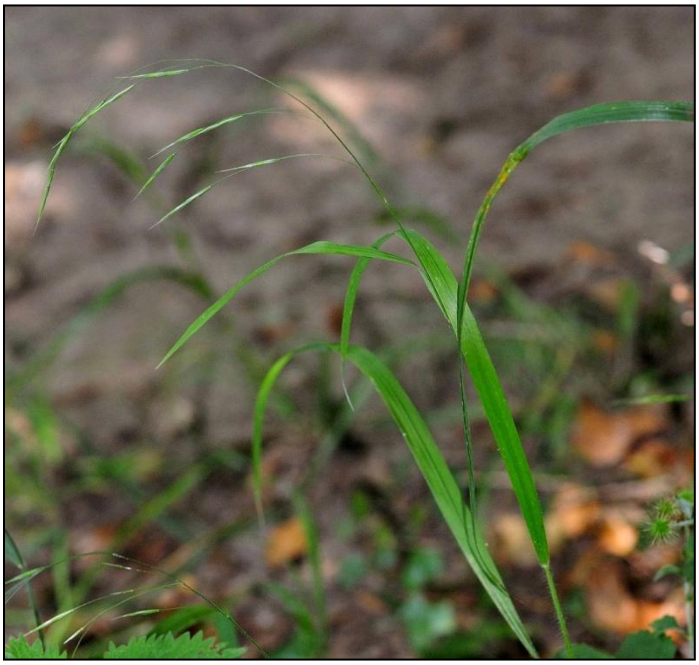
Lydd Ranges	TR0017	MoD land, SSSI	9 August 2013	OL, GK & TI	
Lydd Ranges	TR0217	MoD land, SSSI	6 August 2012	OL, GK, SB & TI	Interruptedly vegetated sandy shingle
Lydd Ranges	TR0219	MoD land, SSSI	6 August 2012	OL, GK, SB & TI	TR 0269 1964, 1 plant in sandy ground near building.
Folkestone Warren	TR2437	SSSI	1 July 2017	KFC meeting	Occasional on sand at the foot of the chalk cliffs.
Sandwich	TR35		8 June 2011	LR	
Sandwich	TR3558	SSSI	23 August 2014	GK & SK	Moss-covered sandy bank by footpath through dunes, with *Carex arenaria* and *Phleum arenarium.*
Sandwich	TR3559	SSSI	6 July 2019	SB	Bare sand disturbed area, TR 3550 5958.
Sandwich	TR3560	SSSI	12 June 2012	SB	Sandy golf course path in dunes, TR 35271 60076. Larger panicle than usual, but conf. EGP.
Sandwich Bay Estate	TR3657	SSSI	18 May 2018	SB	SBBO's Restharrow Field around rabbit burrows at TR 364 570.
Sandwich Bay Estate	TR3658	SSSI	26 June 2013	SB	A few plants on bare sand in dunes at TR 36046 58377, with *Festuca arenaria.*
Deal - Sandwich	TR3755	SSSI	31 August 2014	GK	TR 3723 5530, on moss-covered dune slope by path, and scattered in similar habitat further north.

Bromus ramosus Huds. subsp. *benekenii* (Lange) H. Lindb. (= *Bromopsis benekenii* (Lange) Holub) (Lesser Hairy-brome)

vc 15 and 16

Rarity / scarcity status

Lesser Hairy-brome is probably not well recorded in Great Britain, with perhaps most records in the Chilterns, and with a thin scattering elsewhere in England, Wales and Scotland; it appears absent from Ireland. Its conservation status in England and in Great Britain as a whole is regarded as being of 'Least Concern'. In Kent, it has been regarded as very rare and latterly, probably extinct. However, it is still present and is likely to be no more than **scarce** in the county, but not well recognised.



Lullingstone. Photo by Lliam Rooney, 16 July 2014

Account

The first discovery of this taxon in Kent appears to have been in beech woodland above Shoreham by R.C. Palmer in 1973. Whilst it was reported by Rodney Burton as still present as a small population in 1986, the Great Storm of 1987 toppled many trees along the valley slopes and ridge, and the habitat and accessibility of this area was severely affected. No other records are given in Philp (1982 and 2010), although the species was searched for.

The grass was presumed lost to Kent, but research by Mervyn Brown gave rise to a reassessment of its status, as it now appears that it may not be uncommon, but that it has been overlooked by virtue of its casual similarity to other species with drooping panicles; by its occurrence in similar habitats to, and alongside, *Bromus ramosus* subsp. *ramosus*; and by the existence of a range of intermediates between the two subspecies.

Shoreham, habitat. Photo by Lliam Rooney, 16 July 2014

The frequency of occurrence of intermediates in Kent would better support treatment of the taxon as a subspecies rather than a full species (and hence the nomenclature of this account) if, indeed, it is to be regarded as a 'good' taxon at all. The case for it being a separate species is bolstered in that its chromosome number differs from that of *B. ramosus.* There is, however, the possibility that some Kent occurrences represent the consequences of hybridisation. Molecular studies of populations in Europe included a hybrid population in North France which subsisted in the absence of its parents, suggesting local competitive superiority of the hybrids with potential to replace the parent taxa.[69]

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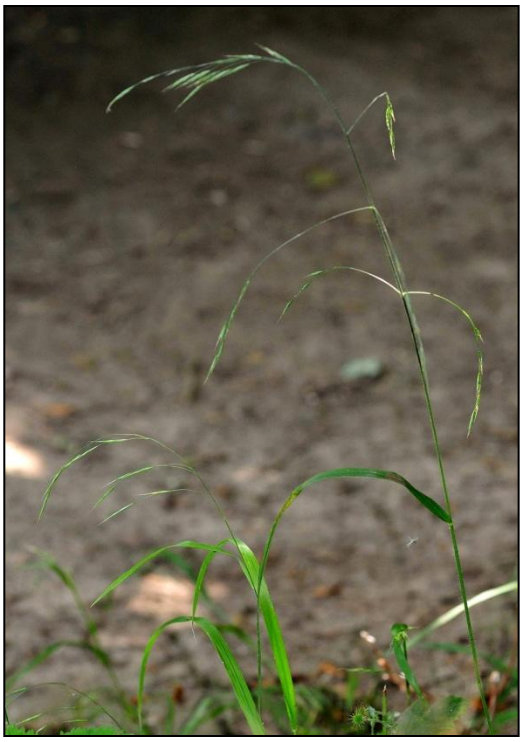
[69] Sutkowska, A., Pasierbiński, A., Bąba, W., Warzecha, T. & Mitka, J. (2015). Additivity of ISSR markers in natural hybrids of related forest species *Bromus benekenii* and *B. ramosus* (Poaceae). *Acta Biologica Cracoviensia Series Botanica* **57(1):** 82–94. https://journals.pan.pl/Content/81855/PDF/08_sutkowska.pdf



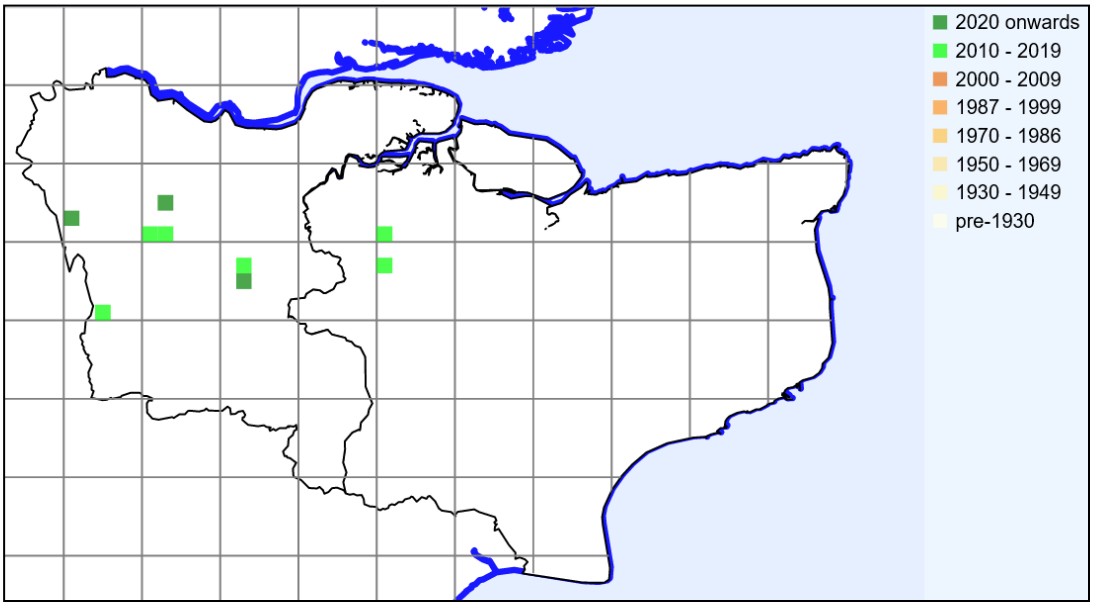
In order to avoid an arbitrary division of the spectrum of variation, for the purpose of Kent recording, identification of subsp. *benekenii* has been taken as positively assigned only to plants at one end of the spectrum. This corresponds with the basis of recognition afforded to Surrey specimens in a Surrey Botanical Society meeting in 2013 with Tom Cope, the BSBI referee, attended by Mervyn Brown and Geoffrey Kitchener.

Lullingstone. The two subspecies compared: subsp. *ramosus* on the right, a large plant with spreading panicle branches; and subsp. *benekenii* on the left, a small plant with weakly drooping panicle branches. Photo by Lliam Rooney, 16 July 2014.

The characters normally assigned to subsp. *benekenii* are that the panicle should be drooping to one side (without the stiffly divergent pendent lower branches which are generally seen in subsp. *ramosus*); that the lowest node should have (1)3-4(5) branches, usually more than two (whereas subsp. *ramosus* normally has two only); that the lowest nodal branches should each have one or 'very few' spikelets (whilst subsp. *ramosus* usually has long lowest branches, with at least three spikelets); that the uppermost sheath is less long-hairy in subsp. *benekenii* than in subsp. *ramosus* (being densely short-pilose) ; and that the small scale at the base of the lowest panicle branches should be without any of the long hairs which are found on the scale of subsp. *ramosus* (but should be pubescent, glabrous or both). In practice, because of the potential for overlap in many of these characters, the status of the nodal scale becomes very significant for what seems a small element of the plant as a whole. Potential hybridity further complicates separation of the two taxa. The molecular studies of a French hybrid population mentioned earlier (Sutkowska, A. *et al*., 2015) noted that there were two different forms: one in which the uppermost leaf-sheath was short-pilose and the lowest node carried no more than two panicle branches; and the other in which the leaf sheath had long and short hairs and the number of lowest panicle branches was more than two. (The paper gives comparative photographs of *ramosus*, *benekenii* and the hybrid, but would be more persuasive if the labels of *benekenii* and the hybrid were exchanged.) Introgression appeared to be in the direction of *ramosus*.

The Lesser Hairy-brome has found been on pathsides or roadside banks in Kent where overshaded by trees or shrubs, and where any highway cutting regime permits it to flourish. Its associated flora is of a woodland marginal nature, and other grass species which may occupy a similar habitat and which, due to their drooping habitat, may detract from spotting Lesser Hairy-brome include *Brachypodium sylvaticum* (False-brome), *Schedonorus giganteus* (Giant Fescue) and *Bromus ramosus* subsp. *ramosus.* These share characteristics of being shade-tolerant and drought-tolerant. Kent occurrences have been primarily noted on chalk, but plants have also been seen on the Hythe Beds of the Lower Greensand near Plaxtol. Nine tetrad records (12 monads) have been made during 2010-24.

***Bromus ramosus* subsp. *benekenii* Kent records to 2024mapped at tetrad level, from BSBI database**



Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Nash (metropolitan vc16)	TQ4062		26 July 2021	GK	TQ 4037 6213, a few plants in woodland shade on chalk scattered alongside bridleway.
Crockham Hill	TQ4550		8 August 2015	SL	TQ 45834 50326, coppiced woodland, a collection of plants under trees growing with *Bromus ramosus s.s.* and *Mercurialis perennis;* showing smaller panicle drooping to one side with no long hairs at base of lowest branch.
Shoreham	TQ5061		24 August 2019	GK & SK	TQ 5085 6113, plant at shaded edge of woodland inside wire fence, with open aspect onto chalk valley pasture slope.
Shoreham	TQ5161		24 August 2019	GK & SK	TQ 5111 6124, plant at edge of Terrace path running through woodland (chalk slope).
Lullingstone	TQ5264		16 July 2014	KBRG meeting	TQ 52858 64326 , a plant in shade beside the footpath leading towards the River Darent between Lullingstone Castle and Lullingstone visitor centre, possessing a drooping panicle, one panicle branch at the lowest node, and a scale at the base of that branch which was not ciliate. *Bromus ramosus* subsp. *ramosus* also present.
Shoreham south east	TQ5260		16 July 2014	KBRG meeting	TQ 5266 6076, growing near junction between A225 and Fackenden Lane in a marginal habitat on chalk under shade of roadside bushes/trees, open to the west. Similar plants were seen by MB & GK in 2013 further north up Fackenden Lane, TQ5361.
Shoreham east	TQ5361	SSSI	17 July 2015	RMB	TQ 5301 6117, north side of Fackenden Lane.
Eynsford	TQ5364		(1) 2 July 2020 (2) 1 October 2019	(1) & (2) GK & SK	(1) TQ 534 646, still present, plus *B. ramosus* subsp. *ramosus.* (2) TQ 53413 64669, about 16

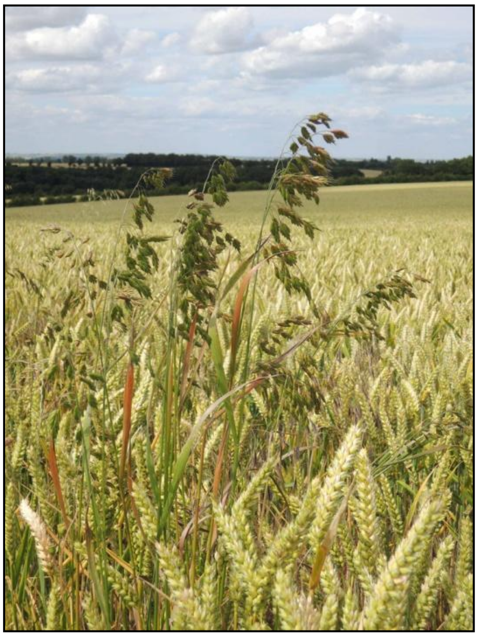
					plants spread out on bank in partial shade under beech adjoining access way and public footpath from A225 to Lullingstone.
East of Plaxtol Spout	TQ6254		5 January 2020	GK & SK	TQ624542, roadbank of the Hurst, wood margin, remains of flowering sufficiently undecayed for determination.
South of Platt	TQ6256		29 August 2019	GK	TQ 6230 5625, west side of lane to Napp Farm, off Long Mill Lane. Shaded lane bank, several scattered plants plus one of *B. ramosa* s.s.. Hythe Beds.
Bredhurst Hurst	TQ8061		6 July 2014	MB	At a woodland margin on chalk, under the shade of beech trees, near a public bridleway on a spur above a valley system near Bredhurst, TQ 8057 6192.
Thurnham	TQ8157		12 October 2015	GK	TQ 8176 5791, on bank under beech on chalk, one plant appearing to qualify fully for this taxon, another seemingly similar but with one hair on scale at branchlet base.

Bromus secalinus L. (Rye Brome)

vc 15 and 16

Rarity / scarcity status

Rye Brome is an ancient introduction (archaeophyte), bearing seeds mimicking rye grain and hence long associated with arable crops; but it has in the past shared the decline of many other arable weeds. The extent of this decline had caused its risk status in Great Britain as a whole to be assessed as **Vulnerable**, but this has been downgraded to the same position as for England alone, viz. **Near Threatened**. In Kent, it was first assessed as scarce for the purposes of this register, based on the number of tetrad records given in Philp (2010). However, as subsequent recording has identified many further locations, the species merits no special rarity / scarcity status in the county. Indeed, this resurgence is also apparent in other parts of lowland England and may represent herbicide resistance being acquired, as with other brome species *Anisantha diandra* (Great Brome), *Anisantha sterilis (*Barren Brome and *Bromus commutatus* (Meadow Brome).[70]) It is treated as a county axiophyte, indicative of good arable habitat.



Selling. Photo by Lliam Rooney, 10 July 2012

Account

It is possible that this annual grass is what Thomas Johnson recorded between Sandwich and Canterbury in an entry of "Festuca altera, Dod. Lolium, 1. Trag. Bromos sterilis altera, Lob." in his *Description of a Journey undertaken for the Discovery of Plants Into the County of Kent in the Year of Our Lord 1632"*[71]. Hanbury & Marshall (1899) regarded it as thinly scattered over the whole county in fields and waste ground, frequently introduced with clover crops. Where present, it might be plentiful, as observed by the Croydon Microscopical and Natural History Club in 1888, when 'In some oat-fields between Hever and Chiddingstone, it was noticed that the oats were overrun to an injurious extent by the handsome grass, *Bromus secalinus*'[72].

Selling. Photo by Lliam Rooney, 10 July 2012

After then, it appears to have declined. It is, however, remarkable that Philp (1982) contains only one reported tetrad record, whereas Philp (2010) gives ten, widely scattered across the county, and many more have been forthcoming since. Records were low in 2010-11, but subsequently it appears that recorders were recognising the species more effectively in their local areas; and during the period 2010-16 the number of sightings was over three times as much as the number of Kent records in the BSBI database in the entire history of recording up till then. New sightings continued unabated afterwards and 2010-24 records cover 124 tetrads (154 monads). These records are widespread across the county, appearing fairly random other than as regards their association with arable land.

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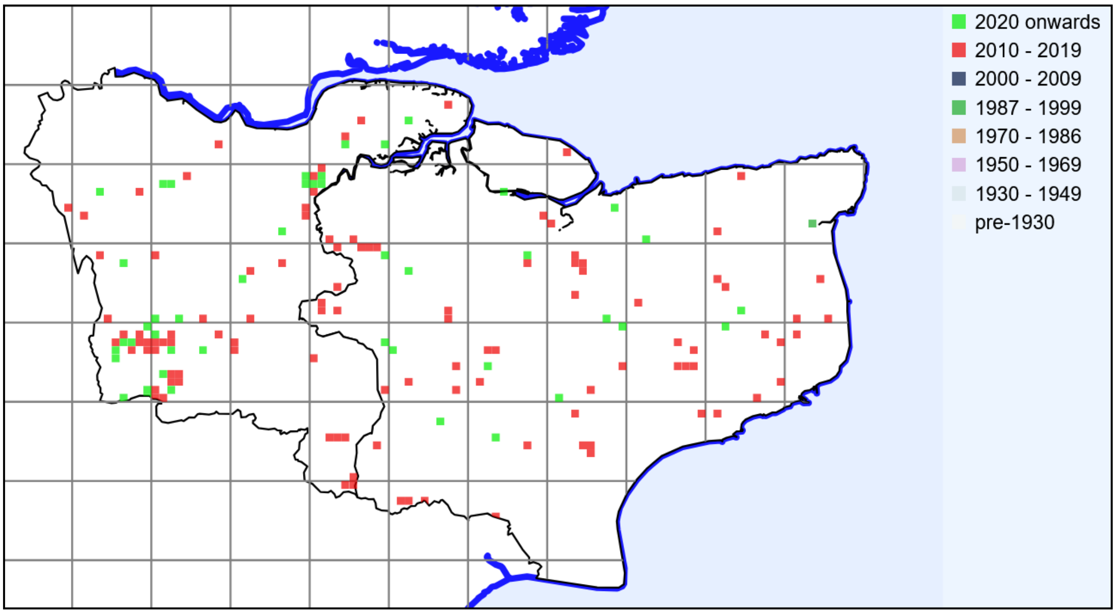
[70] Davies, L.R., Onkokesung, N., Hicks, M.B., Edwards, R. & Moss, S. (2020). Detection and characterization of resistance to acetolactate synthase inhibiting herbicides in *Anisantha* and *Bromus* species in the United Kingdom. *Pest Management Science* **76(7):** 2473-2482.

[71] Hanbury & Marshall (1899) wrongly assign this to Johnson's first Kentish journey, in 1629. Francis Rose gave the identity as a possible one, in the 1972 edition of Thomas Johnson's Journeys. If correct, it would be the first record for the British Isles, but it is not given in David Pearman's *The Discovery of the Native Flora of Britain & Ireland* (2017).

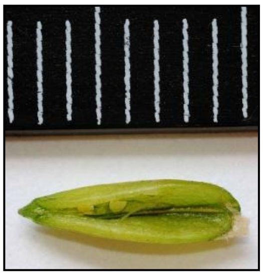
[72] *Proceedings and Transactions of The Croydon Microscopical and Natural History Club* (1889), p.ci.

Bromus secalinus **Kent records to 2024 mapped at monad level, from BSBI database**



While some of this apparent change in Kent is likely to be a matter of improved recognition and widespread recognition, but there is a background of new records being made across England, as mentioned above. The recent Kentish records have continued the pattern of arable occurrences, so there is as yet no evidence here of introduction as a grass seed contaminant, which appears to be taking place elsewhere. Nor is there evidence of association with any particular soil type. The suggestion by Stace & Crawley (2015)[73] of introduction as a constituent of seed mixtures used in conservation schemes is an interesting one and may account for some cases where a sown arable margin is maintained, but there are many occurrences without evidence of this. Cessation of arable stubble burning may have offered encouragement, but increasing herbicide resistance seems likely to have played a substantial part in its spread.

There is usually a very substantial population in the fields of Ranscombe Farm, which appears to be more responsive to the effect of minimal tillage (harrowing) than to a ploughing regime; it is not clear whether this is an effect of autumn germination surviving minimal tillage, but it is certainly possible, given that ploughing would have tended to bury seedlings, whilst minimum tillage would have moved them aside.[74]



In-rolled caryopsis, from Selling. Photo by Lliam Rooney, July 2012

There are a number of Brome grasses which may be found in and around arable crops, but *B. secalinus* (together with *B. pseudosecalinus*, not found in Kent, which may not be a fully separable species in any event) is distinctive, at least when mature, by virtue of the lemmas being wrapped around the caryopsis, itself with in-rolled margins. The individual florets therefore look more rounded than those of other Brome grasses, more distinctly separated from neighbouring florets and so that the rhachilla upon which they are borne is not fully obscured by them. This becomes more distinctive with maturity; in earlier stages, *B. secalinus* may not be so clearly separable from Meadow Brome *Bromus commutatus* (or *B. racemosus* in the wide sense), which is also found on arable margins.

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[73] Stace,C.A. & Crawley, M.J. (2015). *Alien Plants*. William Collins, New Naturalists Library.

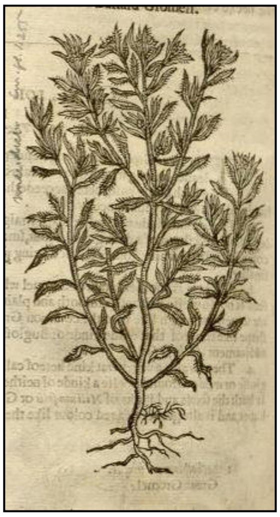
[74] Moyse, R.I. & Shellswell, C. (2016). A comparison between the impacts of ploughing and minimum tillage on arable plant assemblages at Ranscombe Farm Reserve, Kent, UK. *Conservation Evidence* **13**: 33-37.

Buglossoides arvensis (L.) I.M. Johnst. (*Lithospermum arvense* L.) (Field Gromwell)

vc 15 and 16

Rarity / scarcity status

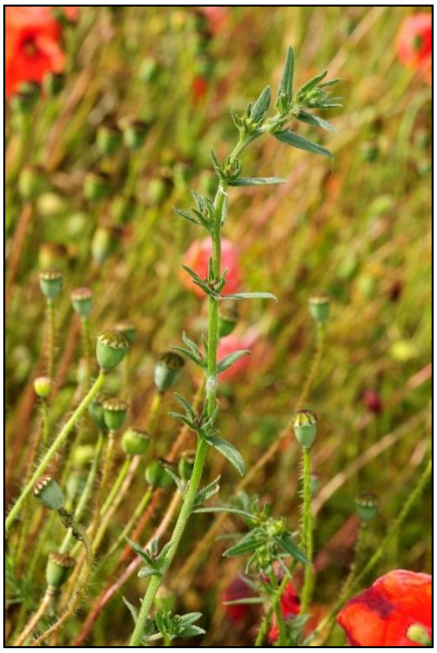
Buglossoides arvensis is an archaeophyte or ancient introduction found often as an arable weed mainly in south east England, being scarce and generally casual elsewhere in the British Isles. It is regarded as an **Endangered** species, both in England and in Great Britain as a whole. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 54% in the likelihood of recording the species. In Kent there is evidence of a 33% decline between the periods 1971-80 and 1991-2005, and the species is **scarce** as well as declining. It is regarded as a Kent axiophyte, an indicator of good habitat.



From John Gerard's *Herball*, 1597.

Account

Field Gromwell was abundant in Kent as an arable weed in both prehistoric and historic times, declining drastically from the 1950s in the face of modern agricultural practices. There is a fair amount of evidence of its early presence in various archaeological contexts. Charred cereal remains in an Early Iron Age pitfill at Cuxton[75] contained a high proportion of weed seeds, including Field Gromwell. Because the neighbouring geology was chalk, it was (surprisingly) considered that this was not congenial for *Buglossoides arvensis* and that the assemblage may have originated further away; but it was surely not necessary to make such an assumption. *Buglossoides arvensis* seeds were also found amongst charred remains apparently derived from Roman grain processing, in the course of excavating a cable trench on behalf of Seeboard in 1994 through the Roman town of Springhead.[76] A little further to the east, near Downs Road, Southfleet, excavations for the HS1 rail route produced further charred cereal remains from a first century Roman context, in which Field Gromwell was the dominant weed (except for samples substantially lacking any weed seeds, which appeared to relate to a late stage of grain processing, following sieving); there were also smaller numbers of seeds in samples taken from a mediaeval kiln[77]. A further find of *Buglossoides arvensis* seeds was made amongst what appears to be re-deposited early to middle Iron Age crop processing waste in a grave-pit at White Horse Stone.[78]



Borstal. Photo by Lliam Rooney, 29 June 2011

The first published record of Field Gromwell in Kent is to be found in John Gerard's *Herball* (1597) where it is stated to be present 'in the yle of Thanet neere Reculvers'. Rather puzzlingly, it was supposed to be 'upon the sands and bach of the sea', rather than in an arable context; although, whether or not Gerard was mistaken in identification, Thomas Johnson, who knew the plant and edited the second edition of the *Herball*, did not seek to change this reference. Field Gromwell continued to be so common that Hanbury & Marshall (1899) gave no stations for it, saying that it was frequent in all districts, especially on the chalk, and was a plant of cultivated and waste ground.

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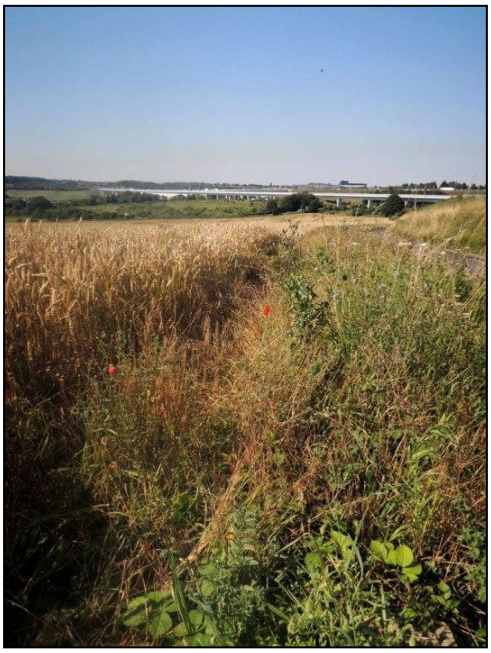
[75] Davies [sic], A. (2006). The charred plant remains from Cuxton, Kent. CTRL specialist report, London and Continental Railways. Accessed via Archaeology Data Service (distributor).

[76] Campbell, G. The Charred Plant Remains, in Boyle, A. & Early R. (1999). *Excavations at Springhead Roman Town, Southfleet, Kent*.

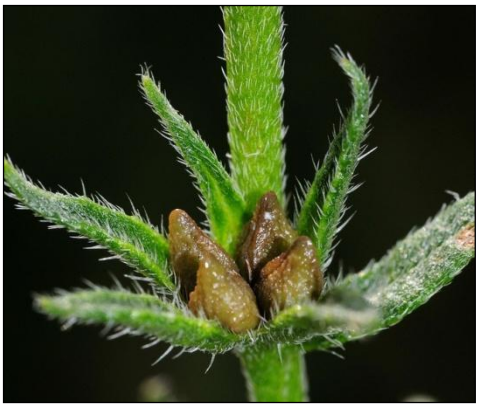
[77] Davis, A. (2006). *The charred plant remains from Northumberland Bottom, Southfleet, Kent (ARC WNB 98).* CTRL Specialist Report, London and Continental Railways.

[78] Giorgi, J. (2006). The *plant remains from White Horse Stone, Pilgrim's Way and Boarley Farm, Aylesford and Boxley.* CTRL specialist report. London and Continental Railways.



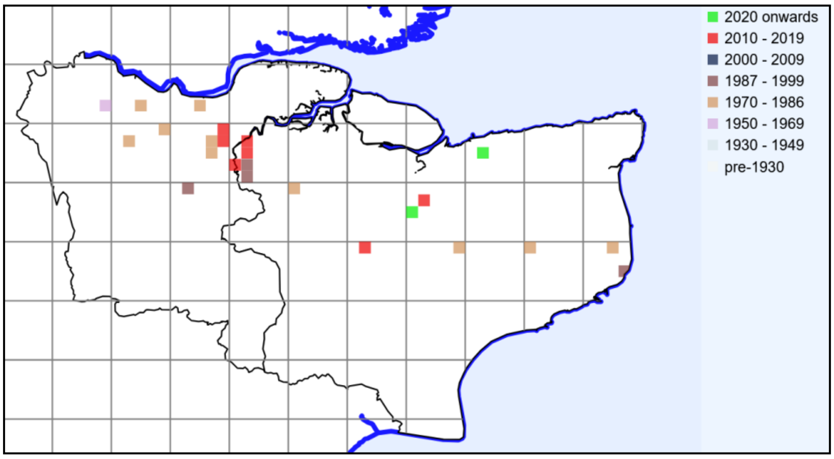
Borstal, habitat. Photo by Lliam Rooney, 29 June 2011

It is likely that some initial reduction in the frequency of the species took place with more effective seed cleaning, although as Field Gromwell drops some seeds around the plant and those remaining would be capable of being gathered with the crop to become a potential seed contaminant, Field Gromwell would not necessarily be dependent on re-introduction. Probably more damaging for survival is the use of agricultural herbicides, so that by the time of the 1971-80 survey (Philp, 1982) the species was listed in only 12 tetrads. These were well spread across the county and followed the chalk soils. The 1991-2005 survey (Philp, 2010) not only showed a decline to eight tetrads, but instead of being county-wide, the distribution was virtually confined to the Medway valley as it passes through the chalk downs. The only non-Medway sites were at St Margaret's at Cliffe in the east and Wrotham Water in the west. Two of the Medway valley tetrads were also noted in the earlier survey; the others were new. Our 2010-24 records, shown on the accompanying distribution map, with only nine tetrads (from the same number of monads), also have a mostly Medway distributional focus.



Borstal. Photo by Lliam Rooney, 29 June 2011

***Buglossoides arvensis* Kent records to 2023 mapped at tetrad level, from BSBI database**



Field Gromwell is a spring annual, perhaps sometimes autumn-germinating and overwintering. Seed production is apparently up to 300 seeds per plant and the seedbank is short-term persistent. Dormancy increases with depth of seed burial and so germination is likely to be favoured by low impact tillage systems which keep the seed near the surface. As an annual, it requires open ground for continued establishment, and it prefers a calcareous soil, although there are a few Kent records with different soil conditions, e.g. arable land on London Clay near Seasalter (Hector Wilks, 1956) and a cornfield by the Medway east of Tonbridge, presumably alluvial (Clive Stace, 1954).

The status of this species for the purposes of this register became potentially equivocal as a result of the discovery in 2018 of hundreds of thousands of plants along half a kilometre of arable field margin on the Lees Court estate (TR0356). These were found to be derivative from a crop of *Buglossoides arvensis* 'Ahiflower' which was sown here the previous year by Lees Court Farm. Ahiflower has been cultivated on the estate from about 2010, initially in a development phase, and then under commercial contracts with an American company, the seed originally deriving from a series of eastern European collections, including the Russian steppes (Sondes, 2015)[79]. The use of Ahiflower is as a nutritional supplement containing omega-3, -6 and -9 fatty acids from oil obtained from pressing the harvested seeds; the yield from the 2016 and 2023 harvests was 0.3t per hectare. Lees Court estate is fairly adventurous in its non-food crops, but it is possible for escape from cultivation to be more widespread, given that some 5,000 acres was said to be grown by some 30 licensed farmers in the UK around 2015, and it has been grown at least in Essex, Gloucestershire, Lincolnshire and Scotland. The species was recorded in the same tetrad in the 1971-80 survey (Philp, 1982), but this must have been as a true native, given that its cultivation had not begun here then. It is ironic that what has been for centuries an arable weed in Kent should now have become a crop in its own right!

Lees Court, crop derivative. Photo by Sue Buckingham, 16 April 2018

Site	Grid reference	Site status	Last record date	Recorder	Comments
Otford/Shoreham	TQ5360		31 July 1997	JP	Over 40 plants at edge of chalky arable either side of footpath leading from Fackenden Down to Shoreham Road, known here for at least five years before. Field was subsequently converted to pasture, so headland is no longer disturbed to enable further appearance.
Eynsford	TQ5366		9 November 1986	RMB	TQ 533 662, Crockenhill Lane – railway.
Longfield	TQ56Z		After 1970, before 1981	Philp (1982)	
Dartford	TQ57L		After 1970, before 1981	EGP & JRP, in Philp (1982)	
Wrotham Water	TQ65J		1991-99	EGP (Philp, 2010)	
Luddesdown – Great Buckland	TQ66S		After 1970, before 1981	Philp (1982)	
Luddesdown - Cobham	TQ66T		After 1970, before 1981	Philp (1982)	
Lower Bush	TQ66Y		(1) 2011 (2) 28 July 2011 (3) 1991-99	(1) RM (2) SP & DC (3) EGP (Philp, 2010)	(1) Probably hundreds of plants at approximately TQ 696 674 (outside the Ranscombe Farm Reserve). [Checked since each year 2012-15, but not seen. RM.] (2) TQ 6953 6737. Many plants scattered along top of field over c. 50m.
Ranscombe	TQ6968		(1) 2016 (2) 23 July 2015	(1) & (2) Communicated by RM	(1) Seven plants in Kitchen Field at around TQ698680. (2) Six plants in Kitchen Field

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[79] Sondes, Countess Phyllis (2015), interview in 50 Farmers Tales, The Recent History of Farms and Farming in Kent (University of Kent), https://www.kent.ac.uk/sac/50farmers/interview-archive.html (accessed 14 December 2018)

					centred on TQ698680, originally discovered by CS.
Gravesend	TQ67L		After 1970, before 1981	EGP & JRP, in Philp (1982)	
West of Eccles	TQ76A		2 June 1991	JP	Eccles old pit, c. TQ 719 608
Medway valley	TQ76B		(1) 28 June 2013 (2) 1991-99 (3) After 1970, before 1981	(1) CS (2EGP (Philp, 2010) (3) Philp (1982)	(1) TQ 71980 63580, Wouldham, a population in south west corner of field ploughed in spring 2013 and sown to barley. (2) & (3) Recorded as tetrad, may have been in vc16, or records in both vc15 and 16.
Eccles	TQ76F		1991-99	EGP (Philp, 2010)	Given only as tetrad.
Burham	TQ76G	KWT managed reserve	(1) 11 June 1997 (2) 1991-99 (3) After 1970, before 1981	(1) FB, DM, DC (2) EGP (Philp, 2010) (3) Philp (1982)	(1) TQ 735 624 given, but may well be centroid for reserve.
Nashenden	TQ76H		(1) 28 July 2013 (2) 1991-99	(1) CS (2) EGP (Philp, 2010)	(1) TQ72183 64073, c. 50 plants present along the west side of field ploughed in spring 2013 and sown to barley.
Borstal	TQ76I		(1) 4 July 2017 (2) 29 June 2011 (3) 24 May 2010 (4) 1991-99	(1) DCh (2) LR (3) SP & DG (4) EGP (Philp, 2010)	(1) TQ 72586 66100, six plants on edge of field a few yards south from *Allium oleraceum* site. (2) TQ 72568 66401 – TQ 72565 66004, Burham Rd, Borstal, c. 100 plants distributed over about 36m on bank, west side of road. (3) TQ 72572 66087 to TQ 72564 66041. 10 plants noted on the edge of a Rape field along Burham Road, near to the M2. (4) -
Thurnham - Detling	TQ85E		After 1970, before 1981	Philp (1982)	
Charing Heath	TQ9348		10 June 2018	SL	Hurst Wood, Charing Heath (AS68), Newlands Road, northern road bank, TQ93524817. Sandy bank of road.
Badlesmere	TR0154		9 May 2023	DCh	TR 01206 54583, one flowering plant in set-aside field.
Hogben's Hill	TR05I		(1) 16 April 2018 (2) After 1970, before 1981	(1) SB (2) Philp (1982)	(1) Hundreds of thousands of plants at the margin of corn field for more than half a kilometre from TR 0322 5603 northwards to TR 0316 5650 and then westwards along the northern margin for about a hundred yards until it reaches a shaw. The population was later found to be a relict from a crop of 'Ahiflower' which was sown as a herbal remedy in the field the previous year by Lees Court Farm. (2) TR05I.
Crundale	TR05Z		After 1970, before 1981	Philp (1982)	
Radfall	TR1364		13 February 2024	DCh	TR 13343 64712, Several plants beside path on underpass
Barham	TR24E		After 1970, before 1981	Philp (1982)	
Ripple	TR34P		After 1970, before 1981	Philp (1982)	
St Margaret's at Cliffe	TR34S		1991-98	EGP (Philp, 2010)	

Bupleurum tenuissimum L. (Slender Hare's-ear)

vc15 and 16

Rarity / scarcity status:

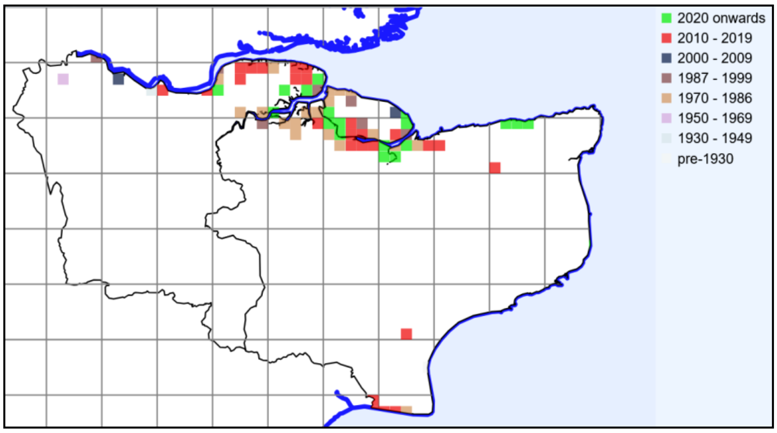
The Slender Hare's-ear is **nationally scarce**. Although the distribution has been regarded as largely stable for some time[80], there have been some losses, particularly in the northerly part of its distribution, such that it is considered to be **Vulnerable**, both in England and Great Britain as a whole. It is included as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006 and is said to be a good indicator of a coastal habitat threatened by agricultural intensification and development (the quality of its habitat is recognised by the plant's treatment as a Kent axiophyte). In Kent, it is uncommon, but sufficiently well represented around Sheppey and the Hoo peninsular so as not to be treated as locally rare or scarce.

Leysdown. Photo by Lliam Rooney, 22 August 2011

Account:

This species was first noted in Kent by John Ray in his *Synopsis Methodica Stirpium Britannicarum* (3rd edn., 1724) as found "near the Ferry in the Isle of Thanet, by Mr. J Sherard". Hanbury & Marshall (1899) refer to it as being frequent at banks and marshes near the sea and tidal waters, giving a historic distribution including its present north Kent range, but extending also to the north east coast and to the Dymchurch area. These latter locations no longer harbour *Bupleurum tenuissimum* to the same degree, but Philp (1982) gives three tetrad records in the Lydd Ranges area. The non-appearance of records here in Philp (2010) represents difficulties of access to the Ranges, rather than a distributional decline.

Overall, Philp (1982) recorded it in 45 tetrads, noting it as very local but sometimes quite abundant on the north coast. The total of 24 tetrads given in Philp (2010) for the period 1991-2005 suggests a decline of 47%. However, this is not borne out by our 2010-24 records, which total 45 tetrads (62 monads).



***Bupleurum tenuissimum* Kent records to 2024 mapped at tetrad level, from BSBI database**

Recording in 2010-24 has re-found in nearly all locations where records were made in 1991-2005. This has included re-finding at some earlier locations as well, e.g. at Reculver and Dungeness, where records were shown in the vicinity in Philp (1982). However, we have not re-found the full extent its occurrence identified in the 1971-80 survey along the Medway estuary, including part of Sheppey. The issues may be the same as for *Artemisia maritima* (Sea Wormwood), i.e. that the absence of recent record may be an effect of riparian development together with difficulties of access. Subject to this, it looks as though the distribution may have been broadly stable from the 1970s; or if there has been any decline, then it is not continuing. The current position is shown at higher resolution in the following distribution map. Since recording was not usually undertaken at this level of resolution before 2010, our register data given here at monad level include only one older record (Margot Godfrey's 2009 record on the west side of the River Darent flood barrage, TQ5377, the only established metropolitan West Kent, or indeed, Greater London, site). The maps fail to show clearly, because it is so marginally coastal, a 2023 record on the east coast at Oldstairs Bay which is likely to represent transmission of plant material from the north coast in the course of repairing sea defences.

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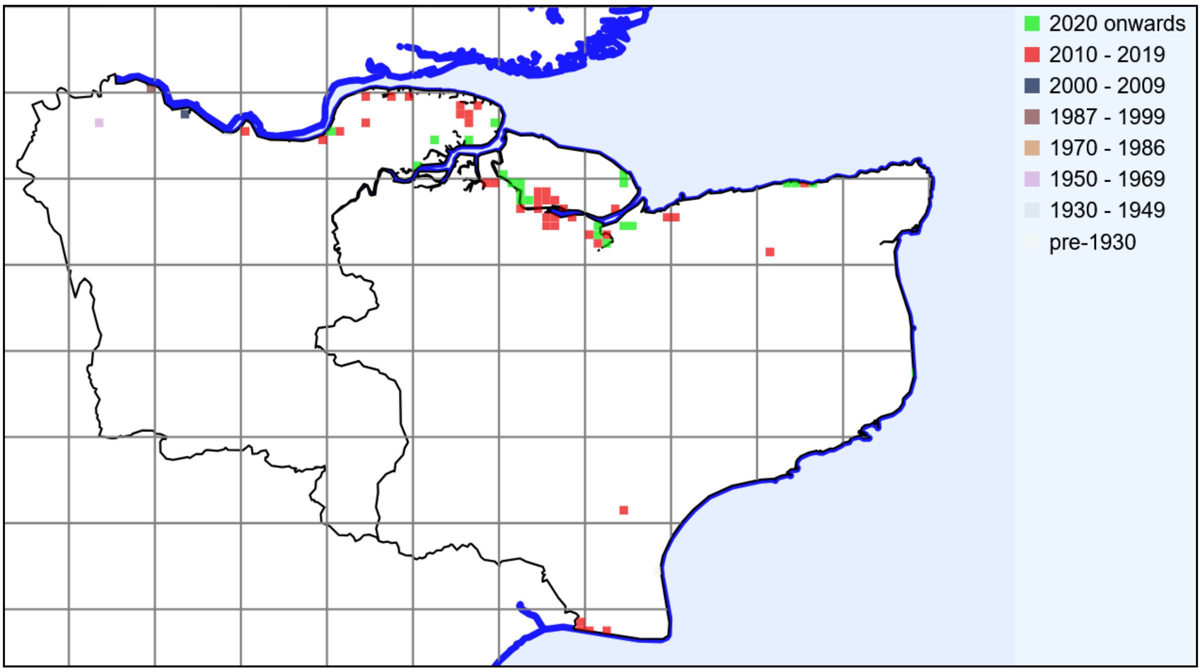
[80] According to the *New Atlas of the British and Irish Flora* (2002).

***Bupleurum tenuissimum* Kent records to 2024 mapped at monad level, from BSBI database**



Elsewhere in Great Britain, there have been some inland populations, now largely gone; but this does not appear to have been a type of occurrence in Kent, other than the discovery in 2014 by Alfred Gay of two small groups of plants on slightly damp and disturbed areas on colliery spoil at Stodmarsh NNR, about 8 km inland from the nearest coastal population at Reculver. The species was seen in 1982 on the centre reservation of the A2 near Dartford, but otherwise has not followed the passage of saltmarsh plants along highways affected by de-icing salt, although it has been seen in 2017 by ordinary residential roads at Whitstable/Seasalter. A 2019 record from Newchurch, over 5km from the coast, was of plants on roadside bare ground where vehicles are likely to have parked; its origin, however, remains mysterious, as this is over 13km from the nearest coastal colonies which themselves are not conventionally accessible to vehicles, being within Lydd Ranges MOD land: it may represent spread from undetected survival at Dymchurch.

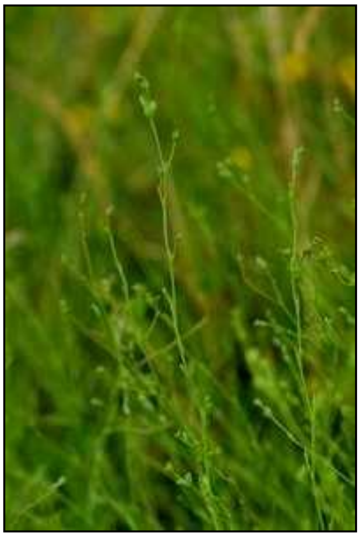
Allhallows Marshes. Photo by David Steere, 19 August 2018

Bupleurum tenuissimum is an inconspicuous annual, flowering from July to September, and appears reliant upon open areas with some bare ground for germination and establishment. It is accordingly subject to population fluctuations. Normally, members of

Apiaceae have seeds with relatively short-lived viability, but seeds of *Bupleurum tenuissimum* have been germinated from herbarium specimens 144 years old[81], which may suggest that populations may recover from apparent extinction if appropriate conditions are provided, although it may be that development after germination is insufficient to ensure viability.

Cleve Marshes. Photo by Geoffrey Kitchener, 12 August 2010. An extensive colony of *B. tenuissimum* in the vehicle tracks below the sea wall.

Characteristically, it may be found on the landward side of sea or estuarial walls, where there is saline influence and there has been some disturbance, such as trampling or vehicle movement. In particular, it is often seen on open grassy ground between sea walls and parallel marsh dykes, where vegetation is not too coarse. It may be overlooked because the thin, wiry stems merge with the grass and the flowers are small. Francis Rose (MS *Flora of Kent*) mentions an association with *Sison* (*Petroselinum*) *segetum*, both growing near the coast and tidal rivers in habitats where competition, except from grasses, is slight.



Cleve Marshes. Photo by Lliam Rooney, 12 August 2010, showing how inconspicuous the plant is, against a background of grasses

Habitat, Allhallows Marshes. Photo by David Steere, 19 August 2018

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[81] Godefroid, S. *et al.* (2011.) Viability of seeds from old herbarium specimens, *Taxon* **60 (2):** 565–569.

Buxus sempervirens L. (Box)

vc 15 and (as naturalised introduction)16

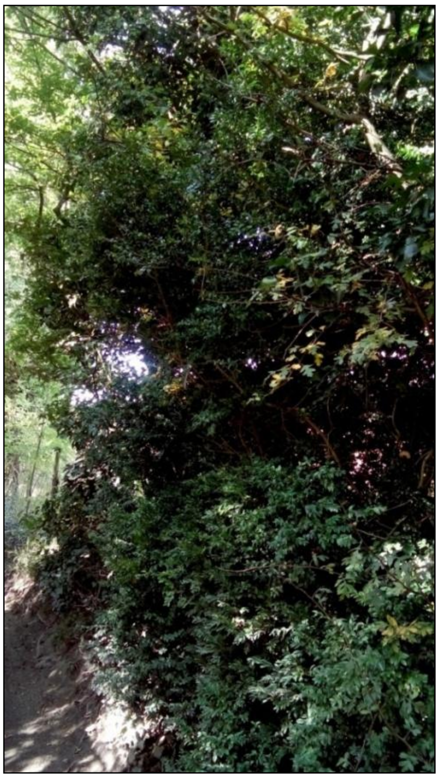
Rarity / scarcity status:

Box has been regarded as nationally **rare**, with (as at 1999[82]), only about ten native sites in Great Britain. Its ancient status on steep, unstable calcareous slopes has been described by M.J. C. Staples[83]. In spite of this rarity, its national survival does not appear to be at risk, and the prospect of threat has previously been regarded as being of 'Least Concern', although more data are required for further assessment and it is currently (in both England and Great Britain as a whole) assessed as 'Data Deficient'. Its Kentish status is obscured by naturalised plants, introduced or deriving from introductions. However, there is only one Kentish population (if it may still be described as a population) with a reasonable claim to native status, and on this account it would be appropriately treated as locally **rare.**

Boxley. Photo by Geoffrey Kitchener, 14 November 2011

Account:

The first published record of Box trees in Kent is in the 1695 edition of Camden's *Britannia*, to which John Ray had contributed information from John Aubrey's notes that "*at Boxley in this County* [Kent] *there be woods of them*". This, however, points to a much older presence there, since the name of the village is derived from the trees, e.g. as Boxeleia (1130) – cf. box-leah, the Old English for box wood. From the reference to "*woods of them*", which suggests abundance, they diminished so that by 1954, when Francis Rose surveyed the Boxley Warren area of the Wouldham to Detling SSSI, he could only find about five trees. This remained the case at least until the great storm of October 1987, which caused considerable damage to the tree cover of the downs escarpment. Just beforehand, Rosemary Fitzgerald had resurveyed the five trees, finding the hill-slope plants heavily shaded - *Taxus baccata* (Yew) grows densely on the steep scarp – which would have affected the ability of even the one really mature individual to set seed. However, planting has since increased those numbers.



Boxley, roadside tree. Photo by Sarah Kitchener, 8 October 2015

Around the time of the Millennium, the Mid Kent Downs Countryside Project, Maidstone Borough Council and Oakover Nurseries evolved a project to propagate cuttings taken from the residual wild trees. In 2003/04, around 300 grown-on cuttings were planted out into the Boxley Warren Local Nature Reserve (at locations centred on TQ 768 597, TQ 766 599 and TQ 763 600) and The Lynch, Detling (centred at TQ 792 587). By 2011, these plants had matured sufficiently to be setting viable seed. The survival rate was apparently almost 100%, once the proclivity of badgers to dig up the young trees when first planted had been surmounted. A consequence is that it may not be possible to assign any further natural regeneration to the original trees or the planted ones, unless inferred from proximity; their genetic content being identical.

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[82] British Red Data Books 1 Vascular Plants, 3rd edn., 1999, ed. M.J. Wigginton.

[83] M.J.C. Staples (1970-71). A History of Box in the British Isles. *The Boxwood Bulletin* 10: 19-23, 34-37, 54-60.

The Boxley (non-planted) location is the south-facing chalk scarp of the North Downs at TQ7759 and TQ7859. The persistence of the species has presumably been related to its ability to grow on the steep and unstable terrain, where other trees (except for *Taxus baccata*) have difficulty in achieving maturity. It is slow-growing, and tolerates shade sufficiently so as to be capable of forming an understorey shrub or small tree.

A survey in 2011 was unable to locate more than two trees. Details are given in the table below but in summary, one roadside hedge-line tree at Pilgrim's Way appears of unclear status, being close to a drive entrance (although its wildness does not seem to have been previously contested); the other is a convincing native. The latter was on a Yew / Ash woodland slope, with *Buddleja davidii* (apparently the continued effect of the 1987 storm, from which the fallen trees and regrowth present difficulties for a comprehensive survey).

There are other records across the county, particularly on chalk, representing naturalised specimens, often in proximity to plantings. Their occurrence has been fairly constant in recent times: the number of records for Box in Philp (1982) – 20 tetrads – fairly well matches that in Philp (2010) – 19 tetrads. It has also been planted in wild situations or in community or amenity woodlands, as a native species.

Boxley Warren (planted). Photo by David Steere, 18 June 2015

For the purposes of the rare plant register, limited value is seen in tracking trends in its naturalisation, so no records are given here beyond the account of its presumed native site at Boxley. Eric Philp in Philp (2010) refers to the species as "Perhaps native at Boxley...and in a few other localities on the chalk". However (personal communication), he was not aware of any such other localities which show significant likelihood of native status; nor is it likely that historic presence would have gone unremarked, whether by botanists or others.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Boxley	TQ7759		(1) 8 October 2015 (2) 14 Nov 2011 (3) 9 December 1986	(1) GK & SK (2) MP & GK (3) RoF	(1) Still present, grid reference taken as TQ 77850 59209. (2) TQ 77849 59217: one roadside tree in hedge by Pilgrims Way, nearly 3m high, 4m wide. Status may be affected by being near a drive entrance. (3) TQ 778 592, one mature plant near Boxley Wood [present, 1989, ACH, some storm damage]. (4) TQ 777 596, a sapling in Boxley Wood [present, 1989, ACH, some storm damage].
Boxley	TQ7859	SSSI	(1) 14 Nov 2011 (2) 9 December 1986	(1) MP & GK (2) RoF	(1) TQ 78004 59480: one tree on N Downs scarp above Warren Farm, Boxley , east of footpath. On steep woodland slope with yew (very near), ash and *Buddleja* – the slopes still show effects of 1987 storm. Trunk was prostrate, lying down the hill slope, with branches

					spreading up to 2.5m high where slope highest, 3.5m where slope lowest, horizontal spread 6m x 6m. No seedlings seen. Searched for other wild trees but none seen. (2) TQ 780 595, mature tree with several saplings in Boxley Wood [present, 1989, ACH, some storm damage].

Boxley, roadside tree.
Photo by Owen Leyshon, 2 April 2016

Kent Rare Plant Register
Species accounts Part C (Ca)

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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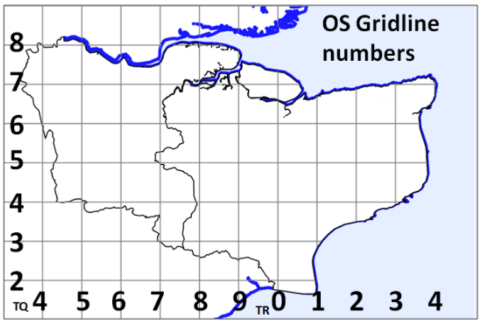
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AC Andrew Craven
AG Alfred Gay
ACH A.C.B. Henderson
AH Alan Heyes
AL Alex Lockton
AS Alan Showler
AW Anne Waite
AWi Tony Witts
BF Brian Ferry
BG Bob Gomes
BW Brian Woodhams
CA C. Alanine
CD Chris Dyson
CEC Carter Ecological Consultants
CH C.Harris
CJC & AP James Cadbury & A. Parker
CP Chris Pogson
CR Chris Rose
CS Clare Sinha
CTP Cecil Prime
DAN David Newman
DC David Chambers
DCo Daniel Colborne
DG Doug Grant
DM Daphne Mills
DMcC David McClintock
DAN David Newman
DN David Nicolle
DS David Steere
DW D. Worsfold
EGP Eric Philp
ES E. Scott
FB Fred Booth
FR Francis Rose
FRB F.R. Bryson
GB Gill Brook
GG Gavin McGregor
GK Geoffrey Kitchener
GV Geoffrey Vine
HM Helen Morley
HP Helen Proctor
JA Jan Armishaw
JEL J.E. Lousley
JH J.Hendey
J J J. Jewsbury
JL J.Lockward
JLM J. Le Mesurier
JM Joumana Mobarak
JP Joyce Pitt
JPh J. Phillips
JS Judith Shorter
JW Jo Weightman
KBRG Kent Botanical Recording Group
KF Kathy Friend
KFo Kenneth Fox
KFC Kent Field Club
L&DH Lorna & Derek Holland
LBB L. Breda Burt
LC Lou Carpenter
LM Lesley Mason
LNHS London Natural History Society
LR Lliam Rooney
MA M. Austin
MAS Mark Spencer
ME Mike Easterbrook
MG Margot Godfrey
MH Margaret Holdaway
MHe M.Herbert
MN Martin Newcombe
MP Mike Porter
MCS Mary Clare Sheahan
MW M. Waite
NA Nik Aspey
NH N. Holmes
NS Nick Stewart
PH Peter Hodge
PHe Peter Heathcote
PHo P. Howarth
PS Philp Sansum
PW P. Worrall
RB R.A. Boniface
RC Ray Clarke
RCa Richard Carpenter
RD Dick David
RE Rosie Earwaker
RF Lady Rosemary FitzGerald
RG Bob Gomes
RM Richard Moyse
RMB Rodney Burton
RP R.D. Porley
RS R.M.Stokes
RW R.H. Woodall
RWa Robin Walls
SB Sue Buckingham
SC Steve Coates
SK Sarah Kitchener
SL Stephen Lemon
TR Tim Rich
TS T. Swandale
WFS Wild Flower Society

Other abbreviations and references:

BM = Natural History Museum herbarium	MNE = Maidstone Museum Herbarium	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	NNR = National Nature Reserve	RNR = roadside nature reserve
KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp	

Callitriche truncata Guss. (Short-leaved Water-starwort)

vc 15; and possibly still present in vc 16

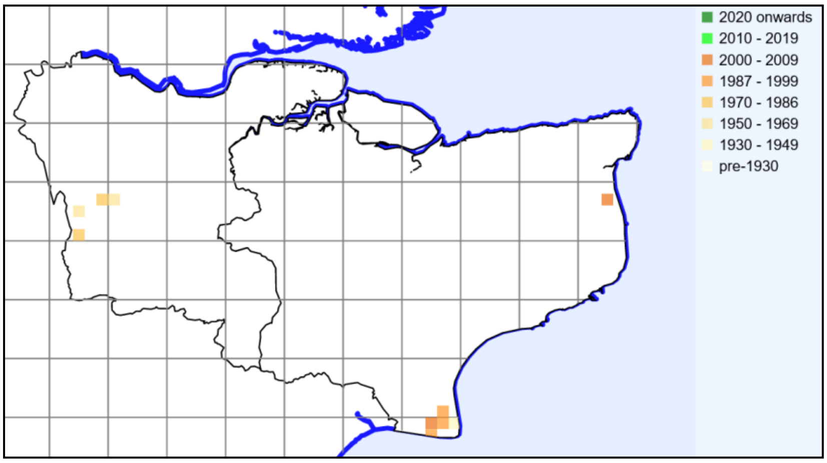
Rarity / scarcity status

Callitriche truncata is treated as nationally **scarce,** although its conservation status is one of 'Least Concern' in both England and Great Britain as a whole. Its main distributional area is in Lincolnshire and through the Midlands; but it is also present in Dorset / Somerset / Devon; Anglesey; Co. Wexford; and the south east – Essex and Kent. It has not been seen this century in West Kent (vc16), although its east Kent occurrences in the Dungeness / Lydd area rank it as having been **scarce** and now become **rare** if, indeed, still extant.

Account

The first published Kent record is by W.H. Beeby in the *Journal of Botany* (1886). He had identified a specimen collected by G.E. Smith from the Darent between Brasted and Westerham in 1837, albeit that this had only one immature unwinged fruit. Investigating the locality in June 1886, he found that it was still there. Hanbury & Marshall (1899) were not aware of it elsewhere, although this may have been a failure to recognise. There is a specimen at Kew collected by A.B. Jackson from Sundridge in 1908. It has formerly persisted along the Darent, being collected by Francis Rose in 1945 at Chipstead and recorded by Ray Clarke in Philp (1982) at Sundridge; but has not been seen recently[84]. The species has a habit of reappearing after absence and can be encouraged by major management changes (just as it can be found in newly created waters); and so the possibility of a return to the Darent should not be disregarded.

***Callitriche truncata* Kent records to 2024 mapped at tetrad level, from BSBI database.**



As well as being found in streams, *C. truncata* occurs in ponds and larger water-bodies, and in Kent this is the case in flooded gravel pits in the Dungeness / Lydd area, where it may also be found in marsh dykes (Philp, 2010). Otherwise in East Kent, it has only been found in the dykes or ditches of the Hacklinge/Worth area and the Seasalter Levels (first noted in 2008). Some wet open locations in the area of Boulderwall Farm, Dungeness where it was present in the 1990s appear since to have become dominated by *Phragmites au*stralis (Common Reed) and the presence of the Water-starwort may be transitory, dependent on the condition of the habitat.

Our plant is subsp. *occidentalis*, which has unwinged fruits and leaf-bases joined by a ridge of tissue across the node, the leaves being short, more or less parallel-sided and truncate or notched at the apex. The fruit is also wider than long, forming a cross when seen from above: this combination is not seen in other British species. The need for ripe fruit limits opportunities for identification, but while this may lead to under-recording of *Callitriche* spp. generally, this species appears to be genuinely elusive and infrequent.

This Water-starwort is often little-branched and long-stemmed, growing in water to a maximum depth of 1.5m. It fragments with the first frosts and the floating pieces may overwinter; the mericarps apparently sink when shed, so that seed spread is unlikely to be far from the parent, although dispersal by wildfowl is possible.

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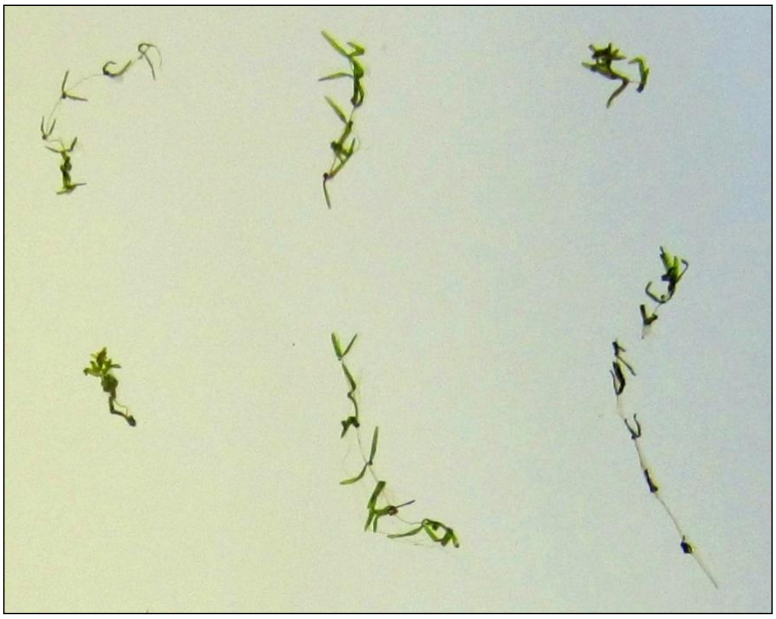
[84] Searched for near Westerham, including by SL in 2016, but river bed appeared devoid of vascular plants.

Site	Grid reference	Site status	Last record date	Recorder	Comments
East of Crockham Hill	TQ4550		30 August 1971	RC	TQ 456 505: there is a very small stream running south at this location. [Searched for, 2015, but only *C. platycarpa* found. SL.]
Sundridge	TQ45Y		After 1970, before 1981	RC in Philp (1982)	
Denge Beach	TR0517		28 June 1996	EGP	Marsh dyke. Specimen In MNE. Reported in *Watsonia* (2001) **23**: 557.
Dengemarsh Farm	TR01P		25 June 1998	EGP	
Boulderwall Farm, Dungeness	TR0619	SSSI	6 June 1999	WFS meeting led by RMB	TR 062 197. In small pond down the track across the road from Boulderwall Farm. The pond was thought to have been recently created by the RSPB, giving credence to the idea that the species can be distributed by birds.
Boulderwall Farm, Dungeness	TR01U		26 June 1996	EGP	
Near Lydd airport	TR02Q		1991-99	EGP	
Seasalter Levels	TR0864	SSSI, RSPB reserve	15 July 2008	CJC & AP	At TR 0800 6432 (occasional in main drain); and rare in ditches at TR 0870 6429, TR 0819 6243.
Hacklinge / Worth	TR3456 & TR3556	SSSI, RSPB reserve	16 July 2008	CJC & AP	In two ditches on Blue Pigeon Farm in Lydden Valley, TR 3492 5644 (occasional) and TR 3506 5637 (rare), between railway and North Stream; not fruiting.



Specimens from Denge Beach, 1996, reproduced by permission of Maidstone Museum

Calluna vulgaris (L.) Hull (Heather)

vc 15 and 16

Rarity / scarcity status

In the context of the British Isles as a whole, it may seem incongruous to treat Heather as in any way rare, and the extent of any risk to the species in Great Britain is regarded as of 'Least Concern'. In England, however, there has been much loss of heathland, and heavy grazing may also have produced a decline in some upland areas (conversely, lack of grazing in some lowland areas may have produced losses through shrub and tree encroachment). A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 21% in the likelihood of recording the species. This reaches the threshold for designation as **Near Threatened**, and so approaches qualification status for a level of risk of extinction in the wild. In Kent, Heather is neither rare nor scarce, although it is treated as a county axiophyte, indicative of good habitat. The level of decline reflected in a comparison between the county surveys of 1971-1980 and 1991-2005 is 11%, less than the calculated English decline, but this covers a shorter timespan than the English data. Nevertheless, in historic terms, heathland has diminished considerably in Kent, and Heather may be regarded as part of a community which has become at risk.

Pembury Walks. Photo by John Buckingham, 16 August 2014

Account

Historic[85] recognition of Kent Heather is preserved in place-names such as Hothfield (given as Hathfelde in *Domesday Monachorum*, c.1100, and deriving from hāþ-feld, open land or common pasture covered with heather). However, this usage may lump ericaceous species together. The long-term presence of Heather at Dungeness is attested by pollen found in 11th to 13th century contexts at Muddymore Pit (TR 062 176)[86]; but the first botanical record of *Calluna vulgaris* in Kent was made on 16 July 1629 by Thomas Johnson (*Iter Plantarum*, 1629), probably at Dartford Heath. Hanbury & Marshall (1899) considered it to be common, chiefly on sandy ground, throughout the county, especially in the south and west, but apparently absent from Thanet.

In Philp (1982) the species is noted as locally common, on heaths, commons and woodland rides on sandy soils. Its distribution is shown with concentrations at the Blean on the Plateau Gravels; across the county following Upper and Lower Greensands (from the Sevenoaks area in the west, where there are remnants of heather on cherty ground where woodland has taken over in the last 70 years or so, extending across to Hothfield Common in the east); the High Weald on Ashdown and Tunbridge Wells Sands (including Pembury Heath); and on the Eocene Sands and gravels of the north western corner of the administrative county (including Dartford Heath). The Keston Common area (on Blackheath Beds) was omitted as outside the administrative county, albeit within vice county 16. The distribution given in Philp (2010) is similar, but with records at Dungeness and Sandwich noted as in unusual habitats but said to be looking completely native there. This is presumably so as regards Dungeness, where very thin peaty soils with low nutrient value have established over shingle; however, there is room for more than one opinion on the status of Heather on the shingly coastal embankment near Sandwich. The later survey produced 140 tetrad records, as against a total of 157 for the earlier survey. Given the different recording approaches between Philp (1982) and (2010), the former being the product of co-ordinated recording by Kent Field Club members and the latter being a single person's survey, it is difficult to be confident whether the compared results indicate a material decline between the two surveys.

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[85] So far as concerns heather's prehistoric presence, a few pollen grains were recorded at a camp on Hayes Common excavated in the 1930s (A.H.A. Hogg, B.H. St.J. O'Neil & C.E. Stevens (1941). Earthworks on Hayes and West Wickham Commons. *Archaeologia Cantiana* **54**: 28-34). Pollen was also found at the Iron Age fortress, Caesar's Camp at Keston, very sparsely in the initial phase of construction, when the site had probably been covered with forest, but more extensively in a later phase of rampart elevation, suggesting that topsoil was brought in from a more open area, but that continuous heath was not present in the vicinity (G.W. Dimbleby, report in N. Piercy Fox (1969) *Archaeologia Cantiana* **84**: 185-199). Moving into historic times, fragments of heather were found in a Roman trackway ditch of the late 1st century and early 2nd century at Cantium Way, Snodland (Dawkes, G. (2015) *Flavian and later buildings at Snodland Roman villa: excavations at Cantium Way, Snodland, Kent*. SpoilHeap Publications).

[86] Scofield, J.E. & Waller, M.P. (2005), A pollen analytical record for hemp retting at Dungeness Foreland, UK. *Journal of Archaeological Science* **32**: 715-726.

Heathland in Kent has, however, until recently long been in decline. This has been coupled with a decline in Heather itself, although it is not confined to heathland, e.g. being a subordinate part of woodland communities on sandy ground. Heathland was formerly much more widespread in Kent, with some 1910ha being present in 1798. The vast majority of this habitat has since gone; there are numerous 'Heath' placenames in the county without any sign now of Heather. The amount remaining is assessed at 73.4ha in the *Kent Habitat Survey 2012 Change Analysis and Results*, but taking the heathland habitat as defined for the purposes of the former UK Biodiversity Plan, the 2005 revision of the Kent Plan recognizes some 85ha remaining by 2005, rising to 110-145ha on the Kent BAP website (2014). Further analysis of the BAP habitat position[87] shows that there have been Kent heathland losses between 2003 and 2012 (3.9ha), largely as a result of conversion to woodland, which may be part of a progression via bracken, scrub and tree invasion in the absence of management. However, these have been much outweighed by gains (20.8ha), mainly from woodland.

Lydd Ranges, shingle habitat. Photo by Sue Buckingham, 7 August 2012

This appearance of gain may in part be an artificial construct from the change analysis methodology, but it also reflects restoration efforts around Tunbridge Wells, Pembury, Mereworth, Bitchet Green and the Blean. Restoration has also been undertaken at Hayes and Keston Commons[88], which do not feature in the Kent Habitat Survey as they are in metropolitan vice county 16, outside Kent administrative county boundary. On Hayes Common, restoration included *Calluna vulgaris* re-seeding from non-local seed.

Pembury Walks, cleared woodland on Tunbridge Wells Sand Formation. Photo by John Buckingham, 16 August 2014

In other locations, restoration appears to have been a matter of restoring open ground with minimal soil cover, for Heather to return naturally. At Hothfield, the process has involved tree clearance followed by soil scraping to remove soil/bracken mulch. Scraping is dependent on the availability of heavy machinery, in the absence of which clearance has been by hand-cutting and raking (as has also been done at Brenchley Wood and Cinderhill Wood). The seeds require light for germination and hence removal of vegetative cover. Although Heather has returned to cleared areas at Hothfield, so have birch seedlings, and these have to be prevented from establishing. Heather at Hothfield has not readily taken a hold where mature grassland exists.

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[87] *Change Analysis of UKBAP priority habitats 2003-2012*. http://www.archnature.eu/assets/files/Activity%201/ChangeAnalysisUKBAP_habitats2003_2012.pdf

[88] John, J. & Price, J. (2014). Heathland restoration at Keston and Hayes Commons: Part of Darwin's landscape laboratory. *Kent Field Club Transactions*. **19:** 75-99.

At Clowes Wood, Covert Wood and part of Hemsted Forest the restoration process by the Forestry Commission has involved first identifying a suitable area with gaps where Heather is already present. This is then mechanically cleared and the debris is shredded, with the shreddings pushed aside if necessary so as to expose the mineral soil. Heather regeneration has then generally taken place quite readily. Subsequent management with autumn use of a forage harvester has encouraged varied-age plants, with some areas of younger Heather and others permitted to mature. The autumnal work also helps spread the seed, for further regeneration. Ordinary forestry operations, however, where tree clearance is involved on thin soils, e.g. the cherty ground on the Greensand Ridge, can be seen to result in a sudden flush of *Calluna* seedlings.

Hunstead Woods. Photo by Lliam Rooney, 9 September 2010

Effective heath restoration appears best undertaken on podzolised soils (viz. generally acid, silicaceous soils from which organic material and soluble minerals have been leached and deposited lower in the soil profile), with surface humose layers removed. This is discussed by C.P.Burnham (2014)[89], who points out that, in contrast, deep rootable subsoils may favour the spread of bracken, as has occurred in some Kent areas of heath restoration. He updated the position on some experimental restorations undertaken from 1993 to 1996 at Yew Tree Farm, Pembury on pasture with topsoil removed, with different plots receiving different treatments, part of which including spreading heathland clippings from the Ashdown Forest. Heather was still present at the three sites concerned in 2013, but two of them sloped down to land with deeper soils and some waterlogging, where rushes and birch were predominating. A further experiment, begun at Newbars Wood in 1992 following pine clearance, was intended to compare the effects of removing the litter layer only with removing litter and humose layers (in both cases with or without the addition of clippings). The treatment involving removal of only litter was apparently the most effective in initial establishment of Heather, but after 12 years the vegetation in all plots was dominated by Heather. By 2013, however, leggy heather remained dominant in the upper part of the site, but the lower part had been invaded by bracken. Burnham attributes this to soil conditions, the upper part being occupied by podzols over sandstone, suitable for Heather; and the lower part comprising stagnogleyic brown earths with poorly drained flushes, a rootable subsoil suitable for bracken spread.

Heather produces a massive amount of tiny (0.6 x 0.35mm) seed in autumn. Not all seeds germinate in the first season and many remain in the soil as a seed bank which persists for up to 40 years. For a plant growing in extensive stands, a strategy of large seed production and persistent seed bank might seem to be inappropriate. However, before forest clearance *Calluna vulgaris* would have used this approach to take advantage of temporary open space in woodland. Germination when it does occur is rapid, in six to eight weeks, and produces well established seedlings before the onset of cold weather.

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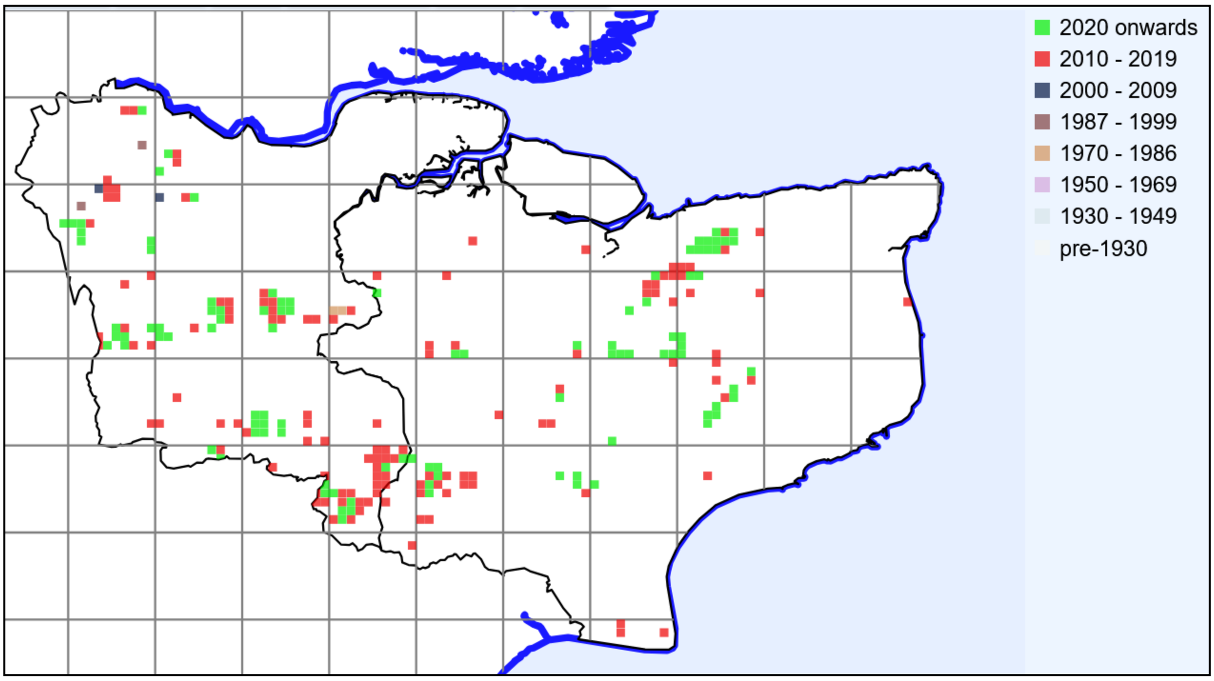
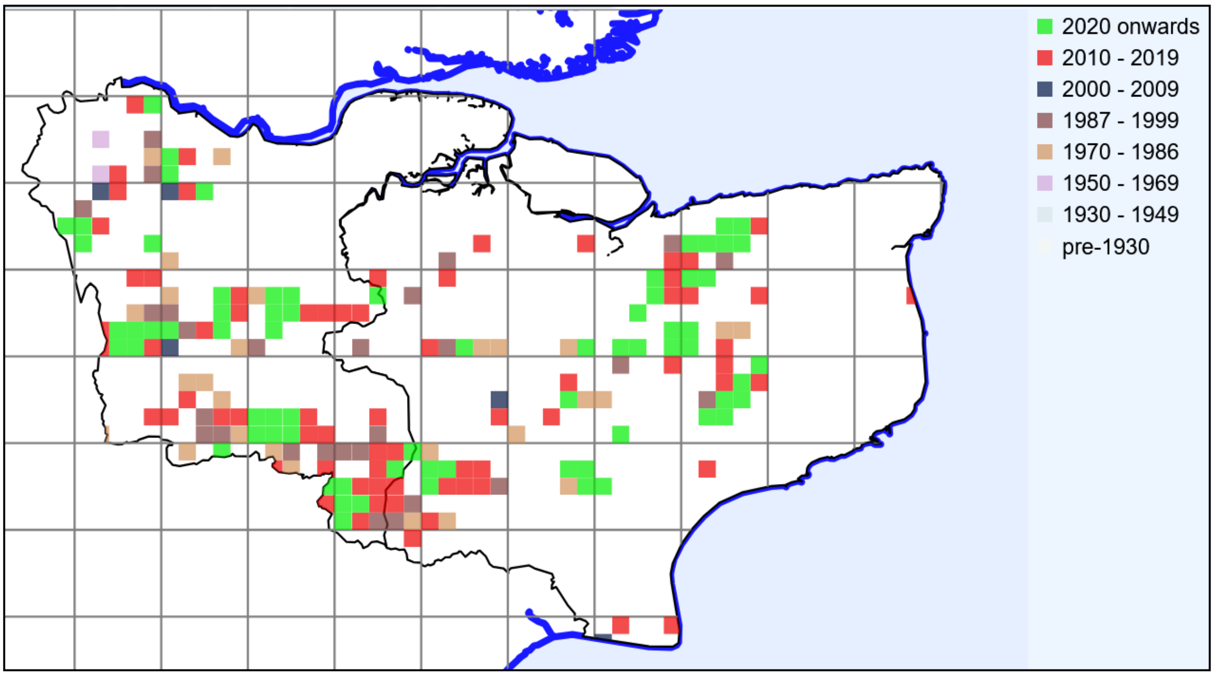
[89] C. Paul Burnham (2014). The geology and soils of heathland in Kent. *Transactions of the Kent Field Club* **19** (Kent's heathlands) 14-38.

For the purposes of this register, Heather records are given in the distribution map below at monad level. The number of pre-2010 records is very few, as recording was then normally undertaken at a lower level of resolution. The records for 2010-24 comprise 225 monads (141 tetrads), which compare well with 140 tetrads for 1991-2005, given in Philp (2010), although eight 2010-24 tetrad sightings are from metropolitan north west Kent, not covered by Philp (2010). A separate distribution map is given at tetrad level, and so brings in older records when recording in 2 x 2km squares was the norm from which one may see the extent of losses, especially from the position in the 1970s.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Calluna vulgaris **Kent records to 2024 mapped at monad level, from BSBI database.**

Calluna vulgaris **Kent records to 2024 mapped at tetrad level, from BSBI database.**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Calluna vulgaris grows on acid infertile soil, generally sand or gravels from which any nutrients have been leached and although damp-tolerant, it seeks the higher ground in wet areas. Unsurprisingly, such barren ground includes land outside cultivation which has historically been common land or manorial waste. Heather has benefited when this land has been maintained open by grazing or (as occurs on Dartford Heath) fires. The diminution in common land grazing over the 20th century is a factor in the decline of Heather, as tree cover (frequently with *Vaccinium myrtillus* (Bilberry) as a replacement understorey) or bracken has superseded it in many places, leaving Heather often as a marginal plant by rides and glades.

Heather can be distinguished from *Erica* spp. which may grow in the vicinity by virtue of having leaves in pairs, not whorls; and having flowers with a petal-like calyx coloured similarly to the corolla, not with a small green calyx and a bell-shaped or inflated corolla.

This account has benefited greatly from the assistance of Sue Buckingham.

Calystegia soldanella (L.) R. Br. (Sea Bindweed)

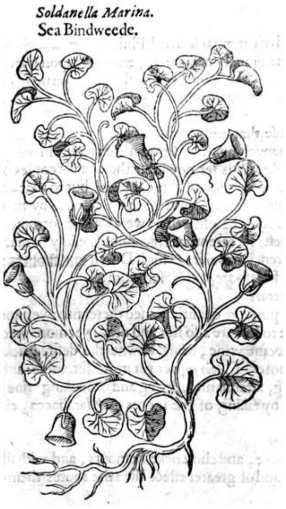
vc 15 and 16

Rarity / scarcity status

Calystegia soldanella is widespread along the coasts of the British Isles, although with a limited presence in Scotland. In Great Britain as a whole, the risk of extinction is regarded as of 'Least Concern'. However, in England there is some evidence of decline, as a comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 30% in the likelihood of recording the species. This reaches the threshold for designation as **Vulnerable** to the risk of extinction in the wild. In Kent, this decline is not reflected in a comparison between the county surveys of 1971-1980 and 1991-2005, and the species falls just short of fulfilling the criteria for being treated as scarce in Kent as a whole. It is a Kent axiophyte, indicative of good quality coastal habitat.

Account

The first published record for 'Sea Bindweede' in Kent is by John Gerard in his *Herball* (1597), where he describes it as growing 'in most places of the Isle of Thanet, and Shepie'. Thomas Johnson listed it at Westgate Bay in his tour of 1632 and there are various historic records for the Sandwich/Deal area, Dover/Folkestone and New Romney. Its West Kent presence had been limited to sightings on the Isle of Grain in the 1940s, but not after 1959, although still then locally abundant. However, with the benefit of access to Yantlet range for survey purposes, Ben Benatt in 2017 found a good-sized colony on an east-facing beach at TQ 88280 77610. Hanbury & Marshall (1899) considered it to be local on sandy or shingly sea-shores in East Kent.


Soldanella Marina.
Sea Bindweede.

From Gerard's *Herball* (1597)

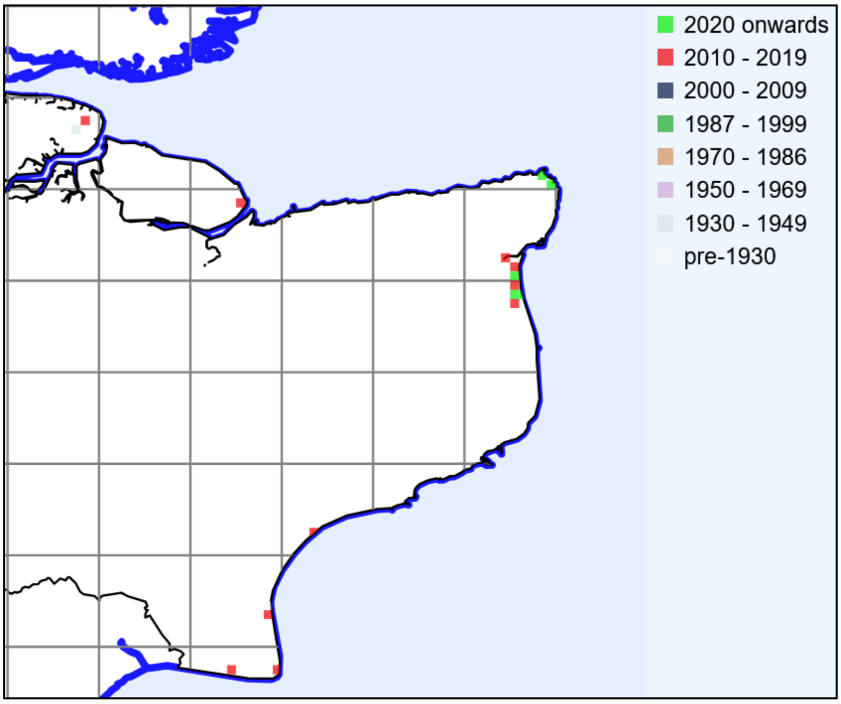
Many of the historic East Kent localities still persisted at the time of the 1971-1980 survey published as Philp (1982), which gave sites at Shellness, Sandwich/Deal and New Romney, also adding a Dungeness site. However, only eight tetrads then yielded records, a number which, if replicated now, would cause the species to be assessed as scarce in Kent. Whilst the Dungeness site was not found for Philp (2010), this later survey restored knowledge of presence of the species on the north coast, including the Isle of Thanet, as also the Dover/Folkestone area. With further discoveries in the Sandwich/Deal area, Philp (2010) produced a total of 13 tetrads, an increase of 62%.

Sandwich Bay. Photo by Lliam Rooney, 22 June 2010

However, this increase related broadly to areas where the species had been known in the not-too-distant past and so may perhaps represent improved recording in relation to the previous survey. The current recorded position is shown on the accompanying 2010-24 distribution map (giving 15 monad records, equivalent to 12 tetrads). Sea Bindweed has been newly found at Hythe and Lydd Ranges in 2013, and added at Grain (see above) – all MOD sites. Whilst these may represent a further expansion of range, the absence of previous record may instead be indicative of difficulties of access to land which has long been used for military purposes.

Sea bindweed is a plant of sandy or shingle beaches and of sand dunes; and so is able to cope with the stresses of a nutrient-poor, saline drought- and wind-prone environment. Recent Kent records on dunes have been made at Foreness Point and the back of Kingsgate Bay (both on Thanet) and at Sandwich Bay.

***Calystegia soldanella* Kent records to 2024 mapped at monad level, from BSBI database.**



Plant material from Sandwich formed part of a molecular study of the species across its entire European range, from the Black Sea, along the Mediterranean, the Atlantic coast and to Devon[90]. It was found that genetic differences between plants did not correlate particularly with their geographic separation. It was suggested that this lack of pattern could be due to a combination of high frequency of long-distance dispersal and great clone longevity. Long-distance dispersal would be aided by the species' capacity for 90% germination after a year of submersion in sea water and 90% buoyancy after almost 27 months. Direct data appear to be lacking for longevity, but the buried rhizomes (up to 1.5m deep) and their clonal growth would be compatible with the species sharing the long-term persistence of many other members of Convolvulaceae.

Production of seed requires the presence of more than one clone, as the plant is self-incompatible.

It is a species not readily confusable with others in its habitat.

Sandwich Bay. Photo by Lliam Rooney, 22 June 2010

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[90] Arafeh, R. & Kadereit, J.W. (2006). Long-distance seed dispersal, clone longevity and lack of phylogeographicalstructure in the European distributional range of the coastal *Calystegia soldanella* (L.) R. Br. (Convolvulaceae). *Journal of Biogeography* **33**: 1461–1469.

Campanula glomerata L. (Clustered Bellflower)

vc 16; probably only recorded in error from vc 15

Rarity / scarcity status

Widespread in Britain, although often only in small populations, Clustered Bellflower is considered to be of 'Least Concern' in terms of threats to its survival, both in England and in Great Britain as a whole. In Kent, however, it is very limited in its occurrence, and so is **scarce**. It is a Kent axiophyte, indicative of good quality habitat.

Halling. Photo by Lliam Rooney, 28 June 2010

Account

John Gerard in his *Herball* of 1597 says that this "smaller kind of Throtewoort...groweth...upon the chalkie hils about Greenehyth in Kent; and in a fielde by the high waie as you go from thence to Dartforde". The chalk of north west Kent is the centre of historic county records, where Marshall in the *Victoria County History of Kent* (1908) described it as abundant. Hanbury & Marshall (1899) also mentioned East Kent records at Dover and Ramsgate, but these were rejected by Francis Rose as being in error. The BSBI database holds records for TQ76 of uncertain date in the second half of the 20th century, but lacking any detail by which one could assess their status. The species appears no longer to be found as a native in vc15, and may never have been.

Francis Rose noted the species as a native of chalk grassland, especially with *Festuca* spp. and *Bromopsis erecta* (Upright Brome), locally common west of the Medway gap from Cuxton to Ryarsh and Luddesdown, formerly in scattered locailtes thence westwards to Dartford and the Surrey border, but absent east of the Medway gap. The distribution seemed to him strange, not least in that the plant was widespread and general on the chalk in Surrey and Sussex. Philp (2010) gives three tetrad records in the Cuxton / Halling area (plus an introduction elsewhere), an apparent reduction of over half against the nine tetrads[91] given in Philp (1982), although it since appears that the species has not become extinct in all these. Our 2010-24 records amount to 12 tetrads (equivalent to 18 monads), and so the position is healthier than as indicated in Philp (2010). One of these monads (TQ6967), however, represents an introduction from spreading Ranscombe-derived green hay and Ditton quarry plants (TQ7157) on ragstone are also suspect.

Henley Down, Luddesdown. Photo by Mark Spencer, August 2020

The species favours chalk grassland banks, and will be at risk where these scrub over or are otherwise managed inappropriately, although it is capable of growing in shade and has been seen in such conditions in quantity at White Pit, Halling, resulting in quite contrasting appearances between plants growing in the open and those under scrub and tree growth. It appears, however, less adapted to shade than *Campanula trachelium* (Nettle-leaved Bellflower), which favours partly shaded chalk banks in similar areas, but whose flowers are not sessile.

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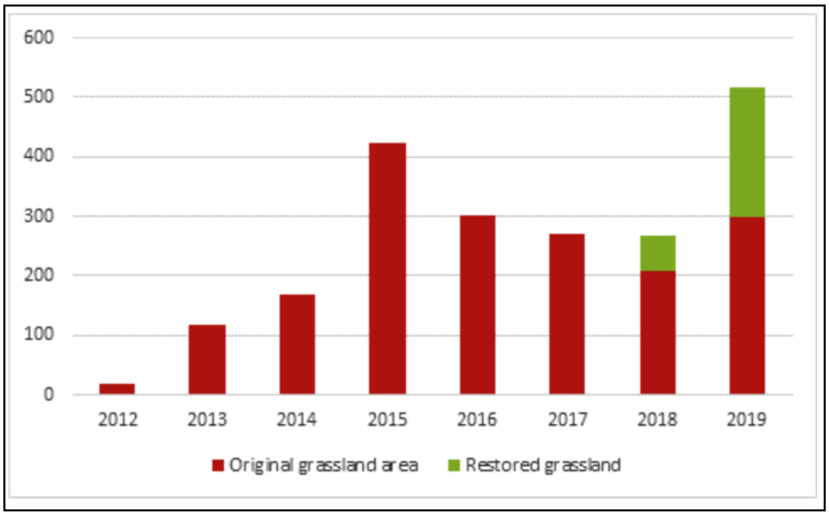
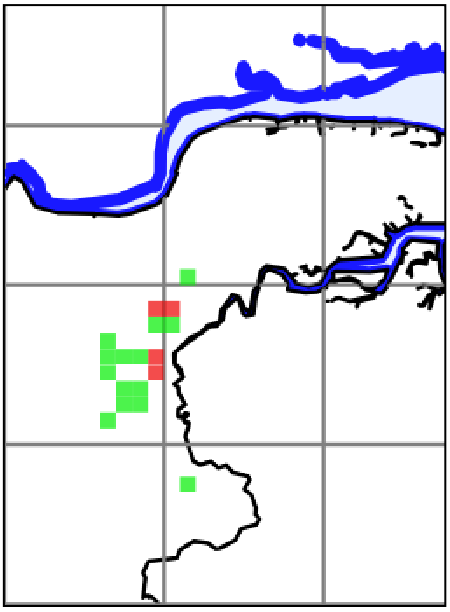
[91] The 'lost' tetrads are TQ66D or E (garden escape, map and text references are at variance); 66M (Meopham), 66Q (Birling), 66R (Holly Hill – since re-found, see table), 66S (Great Buckland - Luddesdown), TQ87M (garden escape).

The responsiveness of the species to appropriate grassland management is shown in the accompanying table (courtesy of Richard Moyse) giving a count of flowering spikes over the period 2010-19 at Mill Hill on the Ranscombe Plantlife reserve, in which an increase is shown both in relation to original grassland habitat, and also an area restored by scrub clearance.



The very limited area of Kent in which the plant is currently known is apparent from the accompanying distribution map, with further details given in the table below.



***Campanula glomerata* Kent records to 2024 mapped at monad level, from BSBI database.**

🟩 2020 onwards
🟥 2010 - 2019

Site	Grid reference	Site status	Last record date	Recorder	Comments
Biggin Hill (metropolitan vc16)	T4057		1975	JP	Chalk slope near Lusted Hall.
Near Chelsfield (metropolitan vc16)	TQ46N		1988	JLM	In a lane. Likely to be an escape, although recorded between Orpington and Chelsfield in 1793.
Birling downs	TQ6661	SSSI	26 Jul 2021	DC & ME	TQ 66127 61559, one plant in downs, maybe where scrub clearance took place a few years ago.
Great Buckland	TQ6664		(1) 24 June 2024 (2) 29 June 2020	(1) LM & LR (2) MAS	(1) TQ 66862 64687. Orchid Bank, Wood bank margin. (2) TQ 6689 6484, Chalk grassland. The majority of plants are within 2-5 metres of the fence-line running alongside Rockingham Forest (the south-west section of the field). This pattern suggests that in the past (possibly up to several decades ago), this field was either ploughed (although recorder was unable to discern signs of this) or

					treated, either with fertilizers or weedkiller. Any one of these activities would have resulted in the loss of plants such as clustered bellflower from the bulk of the field; recolonisation would have occurred gradually from plants surviving along the margins.
Luddesdown south	TQ6665		21 June 2023	RM	TQ 669 657.
Luddesdown	TQ6666		(1) 17 June 2024 (2) 13 July 2022 (3) 26 July 2020 (4) 15 July 2020 (5) 15 August 1995	(1) LM & LR (2) RM & KF (3) DS (4) MAS (5) JP	(1) TQ 664 665. Silverhand, Henley Bank (Down) (2) TQ 664 665. Henley Down. (3) TQ 664 665, Chalk grassland, Luddesdown, Henley Down. Recorder considered this field probably contains one of the largest surviving populations of clustered bellflower in Kent. (4) Two plants flowering at TQ 6635 6660. (5) Large colony in chalky field at TQ 664 666.
Luddesdown	TQ6765		29 June 2020	MAS	TQ 670 655, Chalk grassland, Luddesdown, Round Wood field (north)
Birling Hill / Holly Hill	TQ6762	SSSI, in part	(1) 23 August 2021 (2) 7 August 2011	(1) DC & ME (2) SB	(1) TQ 678 624, hundreds, probably thousands, of plants in field just east of Birling Hill. (2) Estimated 50+ plants, chalk slope among scrub; TQ 67448 62414 to TQ 67647 62389.
Ladd’s Farm	TQ6763		(1) 22 Juky 2024 (2) 6 July 2012	(1) LM & LR (2) LM	(1) (a) TQ 67607 63247, TQ 67627 63257 and TQ 67623 63224. Holborough Woods, Lad's Farm Field 6. (b) TQ 67913 63547, Field 7. (2) 68 plants recorded over field, TQ 677 634, TQ 678 634, TQ 678 635, TQ 679 635 (mostly with 10-figure grid references).
Ladd’s Farm	TQ6862		(1) 1 July 2024 (2) 19 June 2016 (2) 28 June 2012	(1) LM & LR (2) DS (2) LM	(1) (a) TQ 681 627. Holborough Woods, Lad's Farm Field 3. (b) TQ 68306 62762 and TQ68158 62772, Field 4. (c) TQ 68449 62874. Holborough Woods, Crookhorn wood track. (2) South of Crookham Wood, just two very small flowering plants seen at top of chalk grass slope. (2) One plant in field at TQ 68016 62713. In another field, 23 plants recorded at TQ 680 627, TQ 683 628, TQ 684 628 (mostly with 10-figure grid references).
Ladd’s Farm	TQ6863		(1) 19 August 2024 (2) 22 July 2024 (3) 27 June 2012	(1 & (2) LM & LR (3) LM	(1) TQ 6839 6376. Holborough Woods, Lad's Farm Field 9; TQ 681 636, Field 8C; TQ 683 637, Field 8A. (2) (a) TQ 68370 63650. Holborough Woods, Lad's Farm Hedge margin. (b) TQ 68355 63698, Lad's Farm Track (3) 200-300 plants in field, TQ683737 and TQ 683 637 (10-figure grid references recorded for 30 sites). Also 250-500 plants in another field, TQ 683 636. This site and/or the preceding entry may correspond to the record for TQ66W in Philp (2010), made after 1990, before 2006.
Upper Halling	TQ6865		7 June 2024	(1) RM	(1) TQ 6838 6556. Several young

north west				(2) LM & LR	plants in woodland ride. (2) TQ 6838 6556. Halling Wood ride
Upper Halling	TQ6964	KWT RNR	28 June 2010	JA	20 plants along grass verge, TQ6901 64387. Assumed to correspond to TQ66X record in Philp (2010).
North west of Halling	TQ6965	SSSI	24 August 2016	GK & LR	Great quantities on floor of White Pit, mostly in open on semi-bare chalk, scrubbing up, but also in more shaded and vegetated areas. Often very small in more open situations.
Cuxton	TQ6967	Ranscombe Farm reserve, owned by Plantlife and Medway Council	(1) 29 July 2024 (2) 1 August 2023 (3) 30 July 2022	(1) LM & LR (2) & (3) RM	(1) TQ 69820 67602. Ranscombe, Brockles Field (2) TQ 697 675, nine flowering stems. Site previously sown with green hay from TQ 7036 72. (3) TQ 697 676. Three flower spikes in area previously treated with green hay. Ranscombe Farm Reserve.
Cobham Park	TQ6968		11 August 2012	BW	Edge of wood.
Cuxton	TQ 7067	Ranscombe Farm reserve, owned by Plantlife and Medway Council	(1) 29 July 2024 (2) 18 July 2023 (3) 30 July 2022 (4) 3 July 2022 (5) 30 July 2021 (6) 1 August 2019 (7) 7 August 2014 (8) 2013 (9) 10 September 2011 (10) 2005	(1) LM & LR (2) RM (3) RM (4) KBRG / BSBI meeting (5)-(8) RM (9) L&DH (10) JP, AW & HM	(1) TQ 7033 6729. Chalk grassland glade in Mill Hill. (2) (a) TQ 703 673, Count of 551 flowering stems. (b) TQ 703 672, count of 346 flowering stems. (3) (a) TQ 703 672. 195 flower spikes counted. Ranscombe Farm Reserve. (b) TQ 703 673. 259 flower spikes counted. Ranscombe Farm Reserve (4) TQ 7034 6730, chalk grassland. (5) TQ 703 673, Mill Hill, 796 flower spikes. (6) Over 550 spikes in Mill Hill grassland, with increased numbers where restored by scrub clearance. (7) TQ 703 672, 168 spikes in Mill Hill north. (8) The Ranscombe Farm count was 119 for 2013, 20 for 2012. The increase appears to have followed some small tree and scrub clearance at the eastern end of their grassland patch. (9) TQ 70069 67440. Mill Hill Wood; one plant still in flower. (10) TQ70319 67305, chalk grassland glade dominated by rank Tor-grass but still with diverse relict flora.
Gadshill	TQ7170		5 August 2024	LM	TQ 71392 70645. Meadow near to farmhouse.
Ditton Quarry	TQ75D	Ditton Parish Council reserve	(1) 13 July 2023 (2) 28 October 2014 (2) After 1990, before 2006	(1) DC & ME (2) L&DH (2) EGP (Philp, 2010)	(1) TQ7157, at least 16 flowers. (2) TQ 71544 57391, one spike in former quarry area. (2) Grid reference corrected from that given in Philp (2010).

Campanula rotundifolia L. (Harebell)

vc 15 and 16

Rarity / scarcity status

Campanula rotundifolia is recorded across the British Isles in dry, open, infertile habitats, although the distribution does not match any other species, with absence from much of Ireland and pockets of relative scarcity in the West Country, the Wash area and inland north west Scotland. In Great Britain as a whole it is not regarded as at risk, its conservation status being of 'Least Concern'. However, in England there is some evidence of decline, and it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 23% in the likelihood of recording the species. In Kent, it is neither rare nor scarce but, comparing the periods 1971-1980 and 1991-2005, Philp (2010) shows a drastic decline in tetrad records of 57% over those given in Philp (1982). It is treated as a Kent axiophyte, an indicator of good habitat.

Account

The first Kent record is that made by Thomas Johnson in his *Iter Plan*tarum (1629). On 16 July 1629 he noted it near Dartford on returning to London from his Kent botanical excursion, at a location called Chalkedale packed with many rare plants ('locum multis & raris plantis refertum') which had formerly been quarried for making quick-lime. Francis Rose (in his notes to the 1972 edition of Johnson's *Journeys*) somewhat enigmatically noted that he thought he knew where this may have been and that the site probably still existed, but he did not state where. (It is probably TQ 5363 7408.) Harebell was recorded by other early authors, for example, Edward Jacob (in *Plantae Favershamienses*, 1777) considered it to be not common '*By Way-sides at* Ospringe *and* Boughton'; Thomas Forster (*Flora Tonbrigensis*, 1816) knew it on Tunbridge Wells Common; and Matthew Cowell (*A Floral Guide for East Kent*, 1839) mentions it at Old Park, Canterbury and Broome Park, Barham. Hanbury & Marshall (1899) gave a minimal account of the species, regarding it as common: it had been recorded in habitats such as downs, dry banks and heaths across the county.

Temple Ewell. Photo by Lliam Rooney, 4 September 2010

By the time of Philp (1982), Harebell was considered to be locally frequent on open chalk downland and dry sandy heathland, with records made in 127 tetrads. However, in the course of the 1991-2005 survey published as Philp (2010), many former sites could not be re-found and appeared to have been lost through building development or the ploughing up of grassland. As a result, the number of tetrad records plummeted to 54, a loss of over half. This represents a decline over twice as fast as the overall English decline, and over a shorter period. Even where habitat disruption due to development or ploughing has not taken place, it may be that habitat modification is taking place. *Campanula rotundifolia* has been found to be negatively associated with nitrogen deposition from the atmosphere affecting community composition in acid grassland, presumably as a result of competition from increased lush growth of surrounding grasses[92]. It is also one of five species of calcareous grassland sites in UK nature reserves (two of which were in Kent) which were found to have declined significantly between 1990-93 and 2006-09 once a critical load of nitrogen deposition had been reached[93].

The following map depicts 112 monad records for Kent records to 2024, but in practice is largely restricted tos 2010-24 sightings (101 monads) because previous records were made at a lower level of resolution (i.e.

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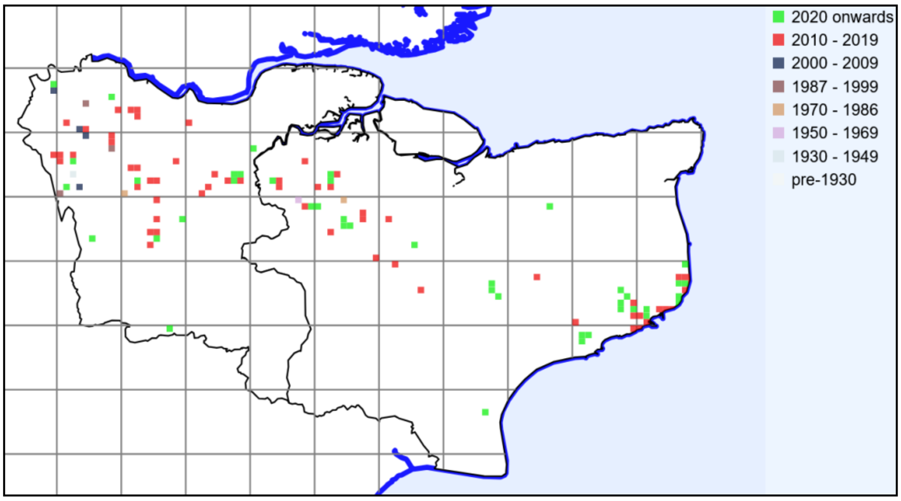
[92] Stephens, C. *et al.* (2011), Changes in species composition of European acid grasslands observed along a gradient of nitrogen deposition, *Journal of Vegetation Science* **22**: 207-215.

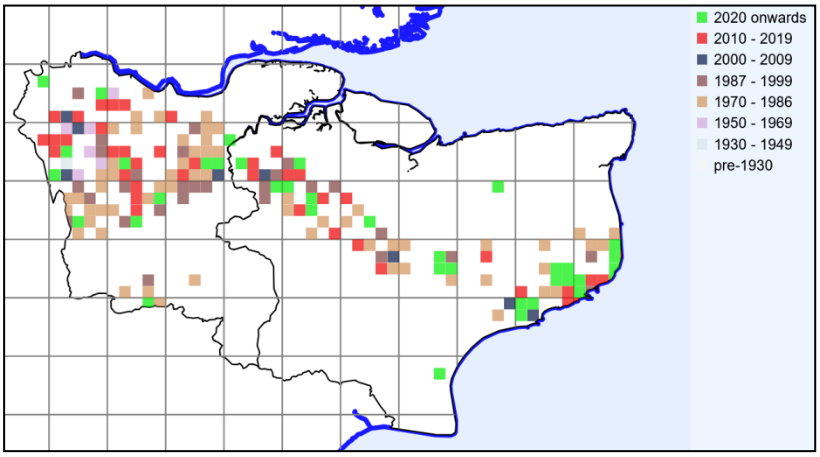
[93] Van den Berg, L.J. et al. (2011). Direct and indirect effects of nitrogen deposition on species composition change i calcareous grasslands. *Global Change Biology* **17(5):** 1871-1883. The other species were *Linum catharticum*, *Briza media, Gentianella amarella* and (not a Kentish plant), *Galium sterneri*.

tetrads). The 2010-24 total is equivalent to 77 tetrads. Although a dozen of these tetrad records are in metropolitan West Kent (particularly from acid grassland in commons and cemeteries), not covered by Philp (2010), there is no evidence of continued decline, given the Philp (2010) total of 54 tetrads for 1991-2005, but the overall position is well short of what was recorded in the 1970s.



***Campanula rotundifolia* Kent records to 2024 mapped at monad level, from BSBI database.**

However, in order to convey a better understanding of the losses which preceded the 1991-2005 survey and our 2010-24 recording, a further distribution map is added below, taken from BSBI database records.

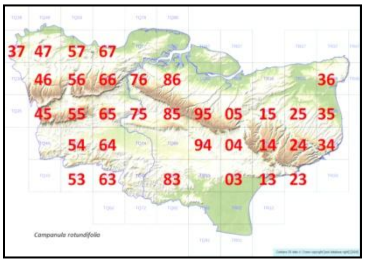


***Campanula rotundifolia* Kent records to 2024 mapped at tetrad level, from BSBI database.**

This is at tetrad level, the standard recording unit from the 1970s, although there are some earlier tetrad records here (1959-69), which generally represent records originally made by the London Natural History Society. It is most likely that they are associated with habitat loss or change in metropolitan north west Kent.

The 1970-86 squares are nearly all attributable to the 1971-80 survey (Philp, 1982), and it is these which provide a truly alarming picture of decline. When added to later (but pre-2010) records, there is not only an extreme thinning out of occurrences, but six whole hectads (10km squares) lack evidence of recent presence. Only 25 hectads have 2010-24 records. By contrast, Francis Rose in his manuscript *Flora of Kent*, compiled largely from records 1940-62, knew of it in 33 hectads – these are even more extensive than given by the BSBI data.

***Campanula rotundifolia:* Francis Rose's data**



Harebell grows in a wide range of habitats, ranging from chalk (as with Johnson's first Kent record) to acid sand (as with Forster's record at Tunbridge Wells), although Francis Rose remarked it as not found on strongly acid soils. It can grow in wet conditions, but in Kent is generally seen on dry ground, where its tap root helps it to cope with drought. More significant than the wetness or otherwise of its environment is likely to be the effect of nutrient-richness on the surrounding floral composition, so that damp fertile clays, for example, may encourage too much competitive growth. Our recent records include chalk grassland, sandy/gravelly commons, exposed chalk cliff-tops, and churchyards (the latter presumably providing old turf in which competitive plants are subject to a degree of constraint). As the species has not been regarded as particularly uncommon in Kent hitherto, our observations as regards the different communities within which it grows here have been limited.

Campanula rotundifolia reproduces both by seed and by vegetative growth; the former may be advantageous in broken ground, the latter under grazing pressure. Spread by rhizomes may result in large clumps, not obvious until in flower. Seed is mostly deposited within close range of the parent and the seed-bank appears to be short-term persistent (over one year but less than five), although there is Swedish evidence of viable seed having survived reversion of grassland to woodland over an 18 year period when grazing was excluded and plants disappeared.[94]

Dartford Heath. Photo by David Steere, 24 October 2016

Temple Ewell, chalk grassland. Photo by Lliam Rooney, 4 September 2010

Ightham churchyard, sandy turf protected from mowing. Photo by Geoffrey Kitchener, 6 October 2024

Campanula rotundifolia is not readily confusable with other species in the British Isles, although there are taxonomic complexities as regards its wider European status. Two British subspecies have been described, the tetraploid subsp. *rotundifolia* and the hexaploid subsp. *montana*. The latter is primarily an upland western taxon (a less delicate plant with broader leaves; fewer flowers, sometimes only one and generally >20mm; and squat capsules) and it is unlikely that this is present in Kent. Under-recording may occur because the species is not always easy to see in mixed grassland when not in flower.

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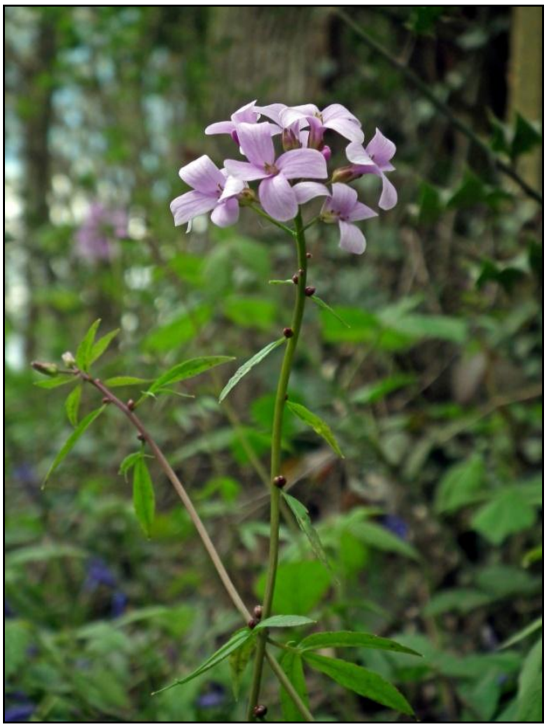
[94] Stevens, C.J., Wilson, J. & McAllister, H.A. (2012). Biological Flora of the British Isles: *Campanula rotundifolia*. *Journal of Ecology* **100:** 821-839.

Cardamine bulbifera (L.) Crantz (Coralroot)

vc 15 and 16

Rarity / scarcity status

Although nationally **scarce**, being as a native more or less restricted to chalk woodland slopes in the Chilterns and to clay woodlands in the Weald, Coralroot is not regarded as being subject to particular risk, whether in England or in Great Britain as a whole. In Kent, whilst not common, it has no rarity status, but is regarded as a county axiophyte, indicative of good habitat.



High Wood, Tunbridge Wells. Photo by David Steere, 27 April 2015

Account

The first recognised Kent record is in Thomas Forster's *Flora Tonbrigensis* (1816), where it is said to be found "in shady places, rarely; on the North sides of the High Rocks; on the rocks by the Little Rivulet in abundance; in a wood near Mount Sion, and near Mayfield". Mount Sion, Tunbridge Wells at least is in Kent and the Little Rivulet may have been so[95]; High Rocks are the Sussex side of the vc border (but the north side could be in vc16); and Mayfield is in East Sussex. The species is still present on Tunbridge Wells Common. There is an earlier reference in Ray's *Catalogus Plantarum Angliae* (1670) to the plant (as *Dentaria major*) on a ditch bank near Sittingbourne; but this was discounted by Hanbury & Marshall (1899) on the grounds that it was likely to have been a mistake, no other botanist having found it near there. This appears to be a reasonable inference, although the more recent discovery of plants near Littlebourne in north east Kent indicates that anomalous distribution is possible.

High Rocks Lane, Tunbridge Wells. Photo by David Steere, 27 April 2015

Hanbury and Marshall's assessment of its late 19th century status was that it was rare and very local, confined to the south and south west parts of the county. This (subject to the Littlebourne discovery) is a fair assessment of its current status. It frequents ancient damp woodland on acid to neutral soils, Weald Clay or Wadhurst Clay, and follows the East Sussex boundary from Tunbridge Wells east to Rolvenden, being present along the Sussex side as well. Sometimes it is found growing on sandy soils (High Rocks and Tunbridge Wells Common). Coralroot generally grows in small localised patches, and populations are probably in general fairly stable: there is an increase in the number of tetrad records between the surveys in Philp (1982) and Philp (2010) from 9 to 14, but this may have been a product of the research into sites undertaken in connection with the paper published by Showler & Rich (1993)[96].

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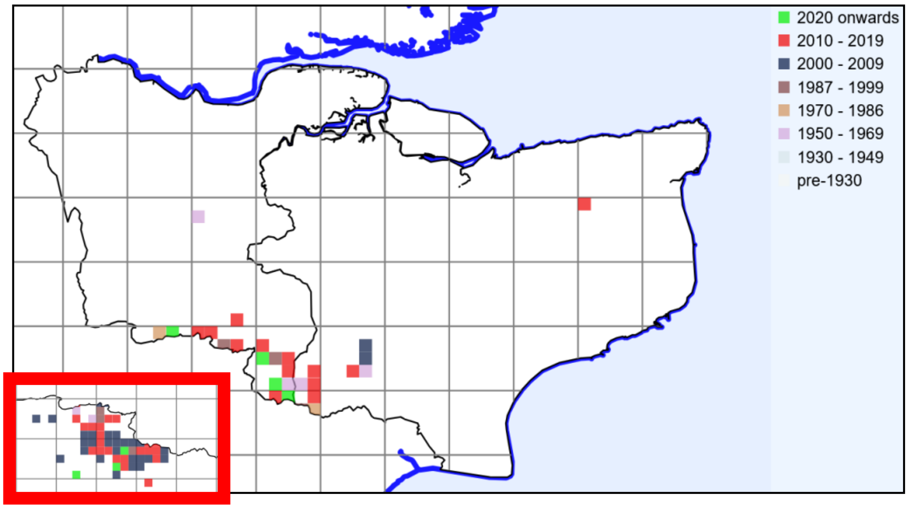
[95] Celia Fiennes, in her travel memoirs of 1697, later published as *Through England on a Side Saddle in the time of William and Mary* , wrote that at Tunbridge Wells "There is a Little rivulet just by the wells w^{ch} divides y^{e} Countys so that y^{e} buildings are some in Kent some in Sussex".



Cardamine bulbifera **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Records for 2010-24 comprise 17 tetrads (22 monads), so there is no significant recent change. The clustering of colonies along the East Sussex border is evident, and the map inset shows how there is a corresponding concentration on the other side of the border as well.

The plant is particularly noticeable when (and if) the purple flowers are out in May, especially where there is limited understorey vegetation, but it does not often set seed. Reproduction is by blackish bulbils which form in the axils of the stem and drop off when developed, but the plant can also spread through creeping rhizomes (the 'coralroot'). On stream banks, it may be that water assists dispersal of the bulbils. Its association with ancient woodland was studied in Showler & Rich (1993), who found that of 22 sites in East and West Kent, 15 were in semi-natural ancient woodland, six were in replanted ancient woodland and one was unclassified. This woodland is often broken into strips between fields, uncleared because of the steep-sided streams or gills, with a tree canopy of pedunculate oak, ash and hornbeam, with hazel and midland hawthorn below. Coralroot often grows in the lower levels of the gills, where damper, as indicated by the presence of *Carex pendula* (Pendulous Sedge). It is sometimes found on damp sloping road-verges, generally at woodland margins and with some association with ditches or water seepage. It is responsive to coppicing[97], and the decline of coppicing in the High Weald may have contributed to a diminution in the amount of *Cardamine bulbifera* at some sites.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Tunbridge Wells, High Rocks	TQ5638	Includes KWT RNR	(1) 15 May 2024 (2) 17 May 2015 (3) 8 May 2015 (4) 27 April 2015 (5) 4 March 2013 (6) 25 April 1992	(1)GV (2)KBRG meeting (3) GK & HP (4) DS (5) GK & SK (6) AS	(1) Recorder reports walking the length of the roadside verge, c. 71 steps and counted c. 142 dying plant stems, only one still in flower. (2) (a) TQ 5650 3849, copse on south side of High Rocks Lane, over 50 spikes. (b) TQ 5641 3851 to TQ 5644 3850, shaded northern bank of High Rocks Lane, just going over flowering, c. 400 spikes. (c) TQ 5618 3850, High Rocks Lane, on shady banks extending into wooded areas beyond, c.50 spikes on south side, over 50 spikes on north side.

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[96] A.J.Showler & T.C.G. Rich (1993), *Cardamine bulbifera* (L,) Crantz (Cruciferae) in the British Isles. *Watsonia* 19: 231-245.

[97] C.A Stace (1994), Observations on *Cardamine bulbifera* around Tunbridge Wells, W. Kent. *BSBI News* 67:13.

					(3) TQ 5609 3855, 36 spikes on shaded south bank of Tea Garden Lane, extending into adjoining copse, 13 spikes on north bank. (4) (a) TQ 561 385, Tea Garden Lane, over 20 plants, not counted in full, plants flowering with bulbils clearly seen both sides of road when it passes through wooded area. (b) TQ563 385, over 200 plants, High Rocks Lane, dense stands along northern road verge for 100m, very occasional plant on southern verge. (5) TQ 5633 84 to TQ 564 384; shaded northern bank of High Rocks Lane, young leaves seen in two places on KWT RNR. (6) TQ 561 385. It appears that the populations here are likely to span the vc boundary. This may also apply to TQ 555 382, near Friezland Wood (JP, 25 March 2012).
Rusthall Common	TQ5639		(1) 2 May 2024 (2) 20 March 2024 (3) 2023 (4) 2021 (5) 2020 (6) 1 April 2019 (7) 16 April 2018 (8) 31 March 2017 (9) 19 November 2003	(1) GK & DCo (2)-(8) CS (9) JP	(1) common, TQ 565 394, still present at pathside in wooded hollow, and a small amount by path above traversing common. (2)-(5) Annual count summaries, see below for arrangements. 2024 - 1169; 2023 – 2706; 2021 – 4055; 2020 – 2393. (6) Annual count, communicated by CS, and undertaken by volunteers supporting commons conservation; site is of c. 400 sq. m. centred at TQ 56581 39461, and total was 2448 plants, of which 414 subsequently (3 May 2019) developed flower spikes. Habitat is a damp hollow in secondary deciduous woodland; primarily ash, but with oak, sycamore, yew, holly, hawthorn and cherry laurel also present. Two informal paths intersect at the centre of the site. The distribution extends up informal steps in a steep bank and along the verge of a path in dry deciduous woodland above the main site. The path verge is flail cut in late summer/autumn, the timing and extent of cut varying from year to year. (7) Annual count 2258 plants, of which 246 subsequently (25 April 2018) developed flower spikes. (8) Annual count 984 plants [another source gave 1163, but still an undercount as some patches were missed]. (9) -
Tunbridge Wells Common	TQ5738		(1) 19 March 2024 (2) 28 March 2023 (3) 12 – 19 April 2021 (4) 23 March 2020 (5) 25 March 2019 (6) 9 April 2018 (7) 17 March 2017 (8) 8 May 2015 (9) 18 May 2012 (10) 28 April 1991	(1)-(3) CS (4) GK & HP (5) GK (6) AS	(1)-(5) Annual count summaries, see below for arrangements. 2024 – 830 plants plus a few appearing next to wall of 1 Hungershall Park and a cluster continuing to do well under oak next to the Cottage front gate. 2023 – 1863 plants. 2021 – 546 plants (count was late, so some plants were probably no

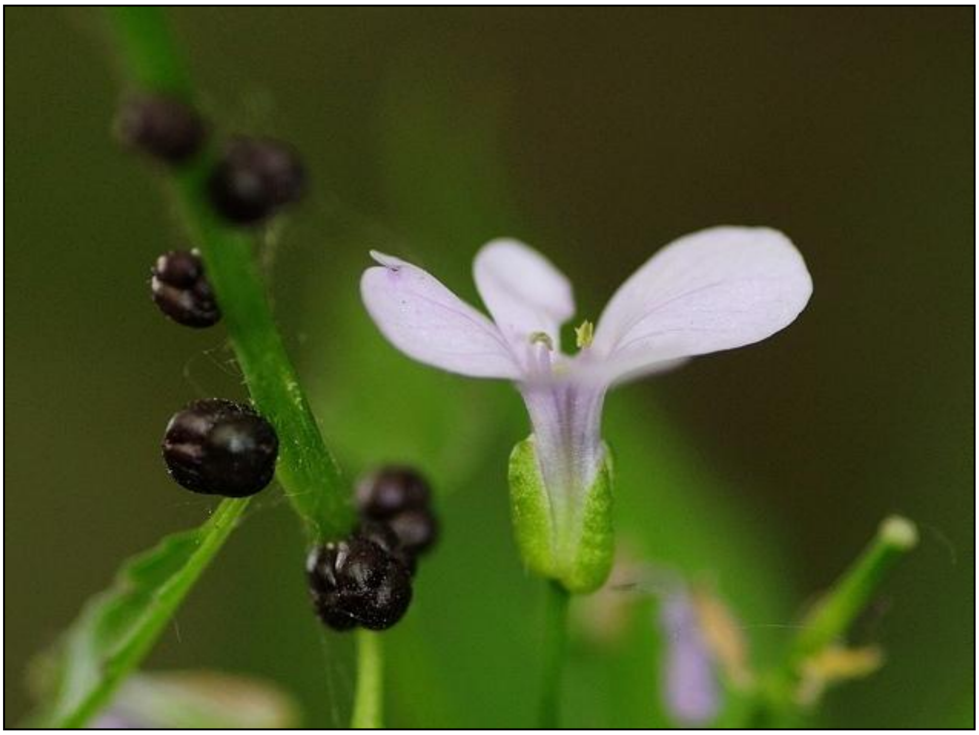
					longer readily spotted.) 2020- - 775 plants. 2019 – 865 plants. (6) Annual count, communicated by CS, and undertaken by volunteers supporting commons conservation; the main site is of c.140 sq. m. centred at TQ 57444 38607, and total was 859 plants, of which 68 subsequently (26 April 2019) developed flower spikes. Habitat is a clearing in dry secondary deciduous woodland, primarily sycamore, but with oak, birch, holly and cherry laurel also present. An ash tree next to the site recently died but with little effect on the overall canopy. Paths run along two boundaries of the main site. There are also outlying groups of coralroot plants along the verges of the paths, one in dense shade. The main site is flail cut in late summer/autumn, the timing and extent of cut varying from year to year. Annual count 752 plants, of which 115 subsequently (25 April 2018) developed flower spikes. (7) Annual count 344 plants [342 in another source] of which 21 subsequently (7 April 2017) developed flower spikes. (8) TQ 5744 3861, grassland on common opposite the end of Cabbage Stalk Lane, 22 scattered plants. Also 9 more nearby, on The Cottage side of north-south footpath. (9) TQ 57422 38601, six flowering plants, shaded pathside on slope in woodland near garden boundary. (10) TQ 574386, 300 flowering plants in dry woodland, Hungershall Park. {Not the same as the site for Tunbridge Wells Common.)
Hawkenbury	TQ6038		(1) 8 May 2016 (2) 27 April 2015 (3) 6 April 2010 (4) 25 April 1990	(1) & (2) DS (2) GK (3) AS	(1) Population half that of 2015, likely due to late mowing of verge, probably less than 50 plants in total. (2) TQ605 387, over 100 plants, bulk of population along High Wood Lane where it transects High Wood, most on northern verge, scattering along southern verge. (2) TQ 60428 38756 in fair quantity, woodland either side of footpath. TQ 60341 38733, small patch on side of High Woods Lane, woodland edge. (3a) TQ 608 381, south of Hawkenbury Wood, near Palmer's Farm, c.100 flowering plants in ancient woodland. (3b) TQ 606 386, Hawkenbury or High Wood, 60 flowering plants on verge, 100 in cleared strip, 300 on dry sandy trackside in ancient woodland, 130 in deep grass on cleared woodland edge.
Mouseden, south of	TQ6139		28 April 1991	AS	TQ 616 394, on stream banks in fragments of ancient woodland, 3

Pembury					groups with 17, 12 and 75 plants.
South of Pembury	TQ6239		27 April 2012	SB	In good quantity on north bank of stream both under woodland at TQ 62165 39791 and continuing westwards outside woodland under bramble and scattered alder for about 150 metres.
Dundale	TQ6338		11 May 2010	GK	TQ 63458.38137, 10 flowering plants in ash - hazel - dog's mercury woodland. TQ 63321.38207, four flowering plants.
Lamberhurst	TQ6636		(1) 17 May 2013 (2) 17 June 1995	(1) GK & HP (2) JP	(1) About 100 spikes in a group in shady woodland near the R. Teise (vc border), with *Anemone nemorosa* and *Allium ursinum,* TQ 668 362. (2) TQ 665 367.
Brenchley	TQ6741		5 May 2019	DC	TQ 67097 41721, two flowers at roadside, adjacent to a wild-looking garden full of Solomons Seal. Recorder, judging from their position on the roadside, doubts that they were planted.
Kilndown south east	TQ7034		(1) 21 April 2024 (2) 20 April 2024 (3) 20 April 2024	(1) SL (2) SL & JS (3) SL	(1) Roger's Rough Road, Kilndown. TQ 70287 34986 to TQ 703163 4999: main colony along road bank on south side of road opposite Petasites colony, extending into shaded unmanaged area of garden behind, estimated at 200 flower stems, densest at TQ 702993 4991. TQ 70271 34977: single outiler flowering by edge by driveway to property. Unmanaged garden behind colony incorporates an older bank with oaks and a few bluebells mixed with garden plants. Google Earth imagery indicates the bank was only incorporated into the garden after the 1960s. On Tunbridge Wells Sand Formation, which includes both sand and silty clay seams, thus explaining the presence of nearby flushed banks on roadsides. (2) Roger's Rough Road, Kilndown, TQ 7029 3499. Flowering colony along road bank on south side of road opposite Petasites colony. Seen from moving car after leaving KFC meeting at Combwell Wood. (3) Details as with 21 April 2024 record.
Finchcocks	TQ7037		25 April 2018	GK & SK	TQ 709 370, alongside private lane (public footpath) from A262 to Finchcocks, at edge of woodland by former railway. In low scrub and lane bank where vegetation cut back, but also in shadier woodland. 30 flowering spikes in vicinity of copper beech plus hundreds of small plants vegetative only.
Bokes Farm, Horns Corner	TQ7329		2011	JP	In gill. Recorded as TQ 735 290, but this may be an approximation. Also seen by JP on 12 July 1999.
Little Pix Hall. Farm / wood north of Seacox Heath	TQ7331		(1) 26 April 2024 (2) 6 May 2014 (3) 28 April 1991	(1) LC & DAN (2) GK (3) AS	(1) Mopesden Gill, three colonies, c.50 flowering plants centred about TQ 73752 31326. In the woodland it was most numerous on the slope down to the stream TQ 73794 31478. (2) In gill woodland, both sides of

					stream and on wooded slopes above, in many locations. These included (a) TQ 7365 31501, where scattered by stream along 25m with *Hyacinthoides non-scripta*, *Anemone nemorosa*, *Ficaria verna*, *Narcissus pseudonarcissus*, *Mercurialis perennis*, *Coryllus avellana*, (b) TQ 73781 31472, scattered towards top of woodland valley slope, (c) several plants at TQ 73659 31377 (this is about as far west in the gill valley as found), (d) several plants at TQ 73786 31512. (3) TQ 737 314: only two flowering plants seen.
Bedgebury	TQ7333	Access land	May 1999	JP	TQ 735 330.
Goudhurst – Bedgebury. Blackbush Wood	TQ7335		12 May 1991	AS	TQ 730 354.
Goudhurst – Bedgebury. Furnace Wood and Wet Wood	TQ73H		1990 or 1991	AS	South side of Furnace Wood, one dense patch with 30 flowering plants and a few stragglers in woodland by track. In Wet Wood, several plants near stream in replanted wet ancient woodland.
South west of Hawkhurst, The Moor	TQ7428		(1) 30 April 2023 (2) 9 May 2011	(1) SL (2) SB	(1) Kent Ditch Bridge, south-west of Hawkhurst, TQ 740 284 / TQ 742 286. A few flower spikes on a narrow road verge by fence along western side of A229 / at least several dozen flower spikes seen from car in narrow wooded strip on western side of A229. (2) 30 plants on roadside under hazel, east side of A229 TQ 74249 28643, just in Kent. Estimated 200 plants on 150m stretch of roadside bank TQ 74239 28652 to TQ 74292 28687, west side of A229, could be threatened by *Vinca minor*.
South west of Hawkhurst	TQ72P (including TQ741285)		28 April 1990	AS	There may be overlap with the TQ7428 and 7528 entries, but records are given for: (a) Kent Bridge Farm, 1120 plants on wood ditch-bank, 40+ plants on shaded road-verge to north. (b) Winch's Plantation, 80 flowering plants in ancient woodland, well above stream level. (c) Peagle Wood, several plants on Kent side of Kent Ditch. (d) ditto ,Merriments Shaw.
Hawkhurst, Horns Corner	TQ7429		28 April 1991	AS	TQ 741 292.
West of Hartley	TQ7434		(1) 1 May 2013 (2) 12 May 1991	(1) SB (2) AS	(1) TQ 7432 3450, on stream bank by bridge and alongside public footpath to TQ 7431 34487 under oak woodland, around 150 plants. (2) 42 plants on edge of ride just clear of conifers in Forestry Commission wood, TQ 747 347.
Bedgebury Forest	TQ73M	Access land	(1) 12 May 1991 (2) 28 April 1990	AS	(1) TQ 743 334, Hedgingford Wood: North side, two patches in woodland near stream; another to the south with 650 flowering plants; and north east corner, 23 plants by stream in hornbeam wood.

					(2) TQ 745 344, north east corner of forest.
Sandhurst	TQ73V		5 April 1995	JP	Roughland Wood
Parsonage Wood	TQ73W		28 April 2000	PH & EGP	
The Moor	TQ7528		(1) 28 May 2013 (2) 9 May 2011 (3) 1990	(1) KFo (2) SB (3) JP	(1) 28 plants at TQ 757 284, off Merriments Lane. (2) 30 plants on bank of ditch, north side of Merriments Lane at junction with B2244, TQ 75914 28227. Associated with hazel. (3) TQ 758 283, on corner nearby road; also common, TQ 755 283.
South of Hartley	TQ7533		3 April 2017	JP	One or two plants in damp broad-leaved tree area.
Great Wigsell	TQ7627		1986	JP	TQ 760 279, in woodland beside A229.
Downgate Farm	TQ7828		26 May 2015	JP	Relict flora under hazel/alder, several colonies.
Field Green	TQ7830		26 May 2015	JP	Meadow Sweet farm, adjacent wood.
Hawkhurst, White Chimney Wd.	TQ7832		(1) 25 March 2017 (2) 23 June 2011	(1) KBRG/KFC meeting (2) JP	(1) Banks of ghyll stream at southern end of wood, TQ 78585 32059. Extensive area of plants in leaf on western bank beside edge of wood and public footpath. (2) Also recorded 29 April 1999, JP.
Rolvenden	TQ8432, TQ8532		9 May 2011	SB	Four plants at TQ 84986 32284, near stream; two plants by stream at TQ 85004 32298; all in Winser Gill, under oak, beech and hornbeam. These sites are probably those recorded by AS in 1991 with 50+ and 17 flowering plants, and may be the area mentioned as Little Oven Wood in Hanbury and Marshall (1899).
St. Michaels, Tenterden	TQ8735		17 April 2008	PS	(a) TQ 875 359 streamside alder coppice and around bases of old ash stools, Lodgefield Wood, Brook Farm. (b) TQ 873 357, along streamsides, Readers Bridge Shaw (adjacent to N side of road).
NW of St Michaels, Tenterden	TQ8736		15 April 208	PS	(a) In and around ditch (est. TQ 8766 3627) and small colony near edge of pit (est. TQ 8767 3619), Bullfield Wood. (b) A patch c.3m x 1m on banks under hazel next to crossing with trackway, est. TQ 8787 3619, at Hogpat Plantation (Hollow Field Wood)
Littlebourne, east of Trenleypark Wood	TR2059		(1) 7 May 2013 (2) 26 April 2012 (3) 17 April 2011	(1) CO (2)PS (3) SB	(1) c.TR 201 590 23 plants in two close patches on NW facing steep roadside bank, five in full flower, most of rest in bud. (2) TR 2010 5902, 15-20 plants, several in flower, 1 with hoverfly in corolla. (3) 13 plants on steep roadside bank, Swanton Lane TR 20100 59015. An anomalous location away from the Weald, discovered by DW according to Philp (2010).
Various	TQ53P, U; TQ63E, J, M, N; TQ72P, T, Z; TQ73F, V, W; TQ83S, TR25E		After 1990, before 2006	EGP (Philp, 2010).	Some of these locations are likely to be represented by the sites described above.
Various	TQ63D; TQ72U; TQ73K, Q; TQ83B		After 1982, before 2006	JP	These sites represent additions to the previous entry (and to the

					records in Philp, 1982) and some of them are likely also to be represented by the other sites described further above.



Swanton Lane near Trenleypark Wood, Littlebourne. Photo by Lliam Rooney, 26 April 2011, showing bulbils

Cardamine impatiens L. (Narrow-leaved Bitter-cress)

vc 15 and 16

Rarity / scarcity status

Cardamine impatiens is fairly widespread in England and Wales, but is absent from easternmost parts, other than Kent, and is nationally **scarce**. It is classified in risk terms as **Near Threatened** in Great Britain, although the evidence of population fluctuations representing current national decline appears limited, and in England its risk status is one of 'Least Concern'. In Kent, it may be taken to be locally **rare**, on the basis of the records in Philp (2010), but the existence of further records means that it is better categorised as **scarce.** It is a Kent axiophyte, indicative of good habitat.

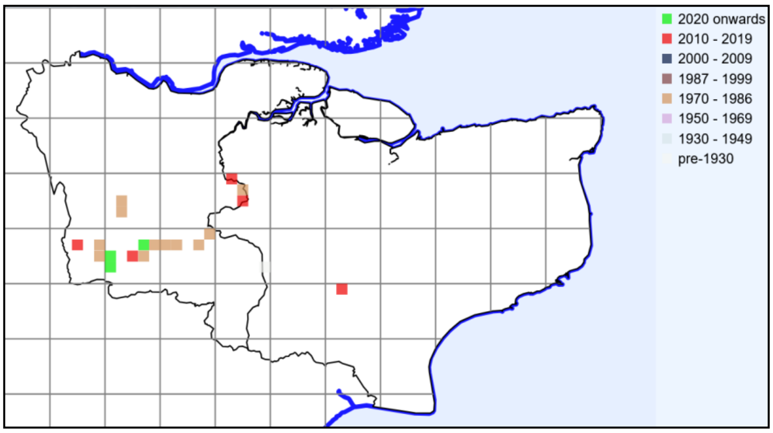
Leigh. Photo by Lliam Rooney, 7 June 2011

Account

The first record for Kent was made by W.H. Beeby, who in the *Journal of Botany* (1880) mentioned finding *Cardamine impatiens* in spring that year occurring abundantly in hedge-banks near Edenbridge, noting it south of the railway by the Edenbridge-Penshurst road[98]. This is in terms as though it were a new find for Kent; but there is also a note in the Botanical Society and Exchange Club's Report for 1879 that he had sent in material from near Maplehurst, which has led to some confusion, especially as Hanbury & Marshall (1899) cited it as a Kent record. It relates, however, to Maplehurst in Sussex.[99]

Leigh. Photo by Lliam Rooney, 7 June 2011

By 1899, Hanbury and Marshall had recognised the species as local and rare in the south west part of the county, by the Eden between Penshurst and Chiddingstone (where it still is), around Edenbridge (where it was re-found in 2014) and near Bough Beech. Philp (2010) regarded it as a plant of banks and damp meadows along the Medway Valley, in decline according to the survey records of Philp (1982) since only found in three tetrads instead of the earlier 15 tetrads (which were largely along the Medway). This apparent decline may not be so extensive: certainly the species continues in the Eden catchment as well as the Medway and it has been found in eight tetrads (11 monads), 2010-24. These include East Kent records from the 1980s through to 2013, near Bethersden, which provide an exception to the Medway/Eden distributional monopoly.



Cardamine impatiens **Kent records to 2024 mapped at tetrad level, from BSBI database.**

The Narrow-leaved Bitter-cress is a biennial of varied habitats, including damp shady woods, river and stream banks and damp roadsides. The ripe seeds are dispersed from explosive capsules and require open ground for establishment. The species may therefore take advantage of temporary open conditions, as reported by Pitt (2000)[100] in relation to the woodland below Hubbards Hill, Sevenoaks, where the species appeared following damage by the 1987 storm until shaded out by regeneration. It has also been pointed out that a colony near Vexour bridge, Chiddingstone in a riverside shaw (see following table) probably benefits from cattle disturbance following a hay cut being taken in the adjoining field, provided that the timing does not result in plants being grazed off; and another site near Chiddingstone was found to carry the species on barer riverside ground with reduced competition, including where erosion has taken place.

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[98] There is a sheet in SLBI which includes a specimen collected by Beeby and marked as 9/5/1880 from near Edenbridge.

[99] Beeby clarified the origin of the find in a short note at p.342 of the *Journal of Botany* (1879), vol. 8 N.S. (Stephen Lemon has kindly drawn attention to this reference).

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Edenbridge	Probably both TQ4446 and TQ4447		10 July 1971	KFC meeting	Shown to KFC meeting by RC, near the lane to Skinners Farm east of Edenbridge. RC and CTP had found one plant here earlier in the year, and the meeting (communicated by RMB) found two more.
Edenbridge	TQ4546		11 May 2014	SL	TQ 45295 46525, 14 plants near south west side of pond (south of Skinners Farm) in shade of coppiced field maple, 13 plants on south side of pond in more open / thickly vegetated bank. None in flower.
North east of Chiddingstone	TQ5045		5 June 2013	SL	TQ 50453 45649 (11 plants), TQ 50456 45632 (20+ plants; [not refound June 2021, NA] and TQ 50462 45631 (2 plants) in now dry oxbow lake situated at edge of River Eden north east of Chiddingstone village. Quite small area and heavily wooded, although OS map does not show it as such. Just coming into flower in three patches along the edge of the wooded core of the ox-bow and the river edge, on barer ground with little competition from other plants, some in areas of erosion.
Chiddingstone	TQ54C		After 1990, before 2006	EGP (Philp, 2010)	May be same site as TQ5045, TQ5144 or TQ5145 entry.
West of Penshurst	TQ5143		(1) 24 June 2024 (2) 16 August 2011	(1) & (2) GK	(1) TQ 5164 4325, two fruiting plants, one large, by public footpath within 5m of western bank of R. Eden. (2) TQ 51647 43254 - several dozen plants under *Prunus spinosa* by west bank of R. Eden near footpath, one outlier about 70m west along path. [Not refound June 2021, NA.]
West of Penshurst Place	TQ5144		1 June 2013	SL & RE	Spread along the R. Eden bank in association with *Allium ursinum*, TQ 51596 44107.
Near Vexour Bridge, Chiddingstone	TQ5145		(1) 13April 2022 (2) 07 June 2021 (3) 7 June 2015 (4) 8 May 2011	(1) SL (2) NA (3) & (4) SL	(1) TQ 5123 4559 only one plant seen, just in flower, east base of ash c.7m from river bank amidst *Mercurialis perennis* in copse immediately east of Vexour Bridge. (2) River Eden, Vexour Bridge, TQ 5122 4559. Small shaw in bend of river. Estimated as several hundred plants (possibly thousands) hidden among growing vegetation, at eastern corner and along eastern side of shaw along river, where recorded in 2011 and 2015.

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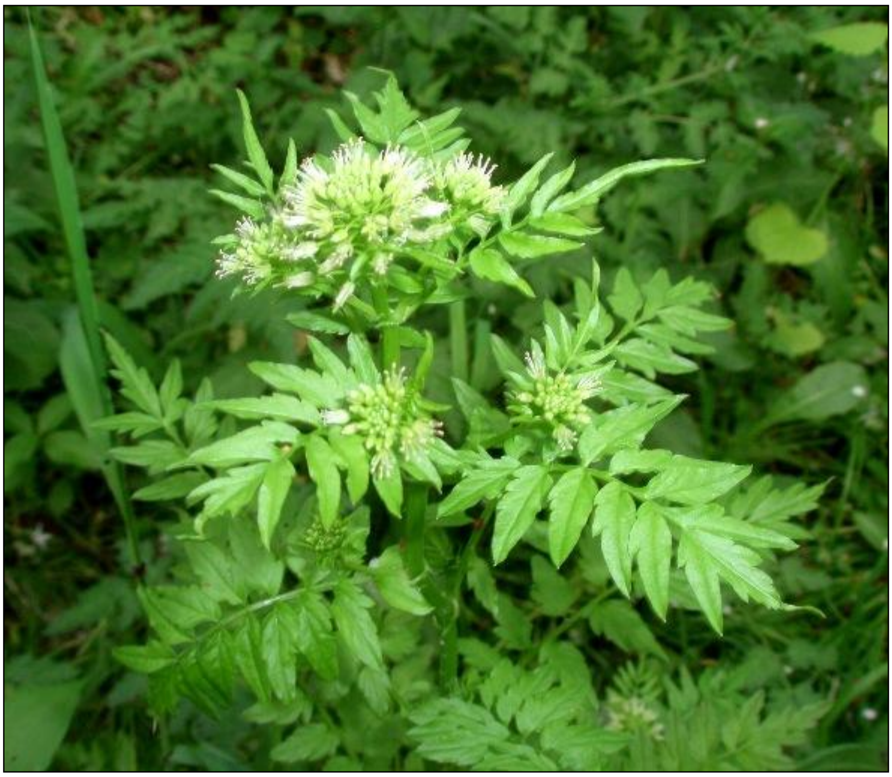
[100] Pitt, J. 2000. *Vascular Plants*, in Waite, A (ed.) *The Kent red data book: a provisional guide to the rare and threatened flora and fauna of Kent*. Kent County Council.

					(3) c. TQ 5121 4558, small riverside shaw, good numbers of plants in flower, highest numbers since flowered in 2011. (4) Growing under trees in a small shaw within a bend of the R.Eden, a short distance along from Vexour Bridge between TQ 511 456, TQ 512 456, TQ 511 455 and TQ 512 455. Canopy is mainly ash and the floor is dominated by *Anthriscus sylvestris*, but there is a mixture of other plant species, including Ramsons. At least 400 plants, with most nearest the river and some in flower. Ground disturbance by cows after neighbouring hay cut may be beneficial.
Between Leigh and Haysden	TQ5545		16 June 2010	SB	TQ 55778 45910; 15 plants beneath a hawthorn in cow pasture in the Medway Valley. Only 3 had escaped being largely grazed off. TQ 55772 45926, three plants beneath a hawthorn in cow pasture, all partially grazed. [Not refound at both sites June 2021, NA.]
Haysden Park	TQ54T, includes TQ5646, TQ5746	Country park managed by Tonbridge & Malling Borough Council	(1) 9 June 2022 (2) 6 June 2022 (3) 16 May 2022 (4) After 1990, before 2006	(1) KBRG meeting (2) AH (3) AH (4) EGP (Philp, 2010)	(1) Very tall flowering and fruiting plants beside a path in tree plantation at c. TQ 564 460. (2) TQ 5792 4668. One plant in flower by the footpath close to the River Medway. (3) TQ 5792 4668. One plant in flower by the footpath close to the River Medway. (4) Little Haysden, TQ54T
Hubbards Hill, Sevenoaks	TQ55G		c. 1990	JP	Appeared for 2 or 3 years following storm damage to woodland in 1987. Seen here by FR in 1955.
Hartlake Bridge	TQ6247		31 July 1971	KFC meeting	KFC Bulletin 17:25, considerable quantities noted in recently cut herbage from river bank. [Identifiable to wood just west of bridge, and gridref allocated accordingly, SL (not seen, 2021)]
Aylesford	TQ7358		(1) 13 May 2018 (2) After 1990, before 2006	(1) SL (2)EGP (Philp, 2010)	(1)Public footpath along River Medway south east of Forstal Road bridge from a footbridge crossing a small drainage ditch near where this enters the River Medway, TQ 73071 5821. At least four large plants between the footbridge and the river in a dense herb layer on the southern bank of the ditch. Communicated to BW who visited on 15 May 2018 to obtain the grid reference and found more plants further south east along the same footpath, in the base of a riverside ditch between TQ 73088 58783 and TQ 73106 58753. (2) TQ 7304 5884; by the Medway banks near the Aylesford Bridge, on the vc15 side. [Not found, June 2013; overgrown until 2018.]
Tovil	TQ7454		21 April 2018	BW & SL	Bydews Wood, Tovil. Sunken path running into wood from the river bank. A group of at least a dozen non-flowering plants near the edge of the path a short distance from the river (TQ 74649 54505) with a single non-flowering plant further

					along the path just after it rises (TQ 74657 54493). No other plants seen higher up this path or elsewhere in wood.
Bethersden	TQ9239		(1) 14 May 2013 (2) 1 June 1987	(1) SB (2) LBB & RF	(1) (a) 30 to 40 plants, prior to flowering, on banks of a shaded pond at TQ 92676 39402 and on nearby stream bank at TQ 92655 39399. Entire area sheep grazed. (b) 17 small non-flowering plants in small wooded area by stream at TQ 92590 39337. Area grazed by sheep. (2) TQ 926 395, south of Low Wood Farm in damp wood with ponds. TQ 927 394, south of Bull Green in wet woodland. N.B. FR also recorded this species from the Beult south east of Buckhall near Bethersden in 1962.



Chiddingstone. Photo by Stephen Lemon, 8 May 2011

Carex canescens L. (= Carex curta, White Sedge)

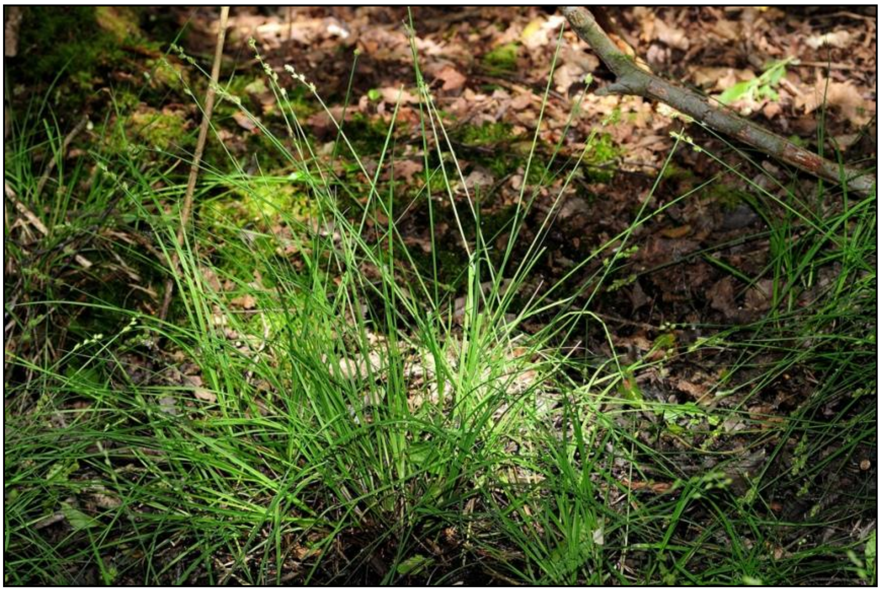
vc 15, long gone from vc 16

Rarity / scarcity status

White Sedge is fairly common in the north and west of the British Isles in bogs and heaths, and so its national risk status for both England and Great Britain as a whole is of 'Least Concern'. The paucity of such habitats in Kent, with the species being reduced to one station according to Philp (2010), led to an initial assessment of its status as being rare. However, further discoveries since then have caused it to be re-assessed as very **scarce** in the county.

Account

The first county record for *Carex canescens* is given by Hanbury & Marshall (1899) as being in Thomas Forster's *Flora Tonbrigensis* (1816), where it is said to grow in "watery and damp places, rarely; in the damp parts of the woods near Frant [this must be in Sussex]; and in the little wood behind the Sussex Tavern, where the spring rises which runs to the Wells". The Sussex Tavern appears to be another name for the Royal Victoria and Sussex Hotel at the Pantiles, and at the 1851 census (around the time when the vice county boundary was established) its occupants were declared as part of the Frant, Sussex census. The wood behind it is therefore likely to have been in vc14, not the West Kent vice county. This is supported by current vice county boundary mapping facilities, which show the boundary along the front of the building itself, albeit with c. 50 metre accuracy.



Orlestone Forest. Photo by Lliam Rooney, 24 May 2011

As the only examples given by Forster are Sussex ones, it accordingly appears that the first record should be assigned to Matthew Cowell's *Floral Guide for East Kent, etc.,* (1839) where under a listing for "Willesboro Leas" there is a reference to this species growing on a bank at the east side of the Lees[101]. Cowell's mention of the sedge as also growing in the Fir walk, Faversham was, however, rejected by Hanbury & Marshall (1899) as almost certainly in error. The latter authors regarded White Sedge as rare in Kent, in boggy pasture and thickets, and preferring a peaty soil. The Willesborough Lees site persisted, with records by Francis Rose from 1944 to 1955 (a boggy ditch and adjacent woodland among *Sphagnum*); by Eric Philp in a small boggy area by a stream in 1977; by a KFC meeting in 1987 ('a fine patch'); and by Joyce Pitt in 2006 when it was in a very overgrown alder carr. After then, it appears not to have been seen until 2014, when found by Stephen Lemon in an area where there had been tree felling the previous winter. He draws attention to the parallels with clearance here recorded in June1955[102] when, next to a boggy field which carried one of two plants of *C. canescens* in a ditch, cleared woodland was found to be intersected with runnels fringed and carpeted with *C. canescens* and *Juncus bulbosus* (Bulbous Rush). Whilst the 1955 cleared woodland is unlikely to have the same footprint as that of 2014 (which probably includes part of what was originally the boggy field), it looks as though disappearance and reappearance of the sedge is a repeated pattern.

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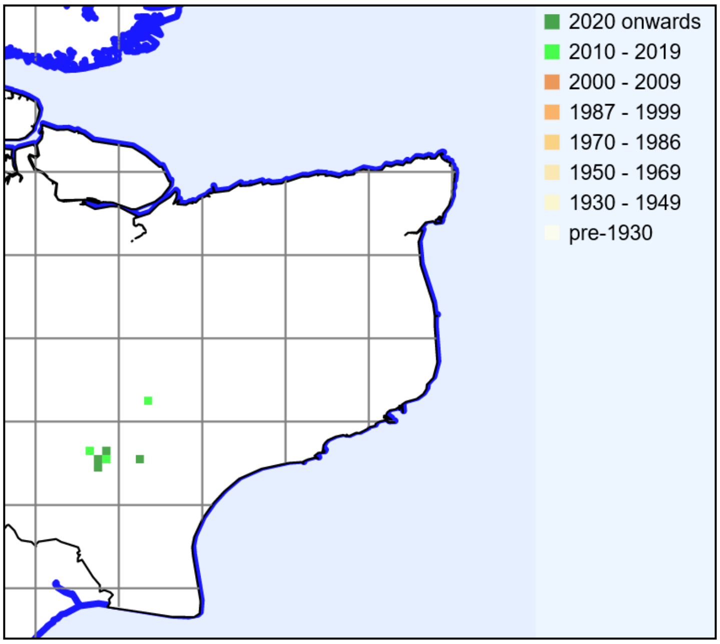
[101] This is flagged as given on the authority of the *Catalogue of rare or remarkable phaenogamous plants collected in South Kent* (G. E. Smith, 1829). However, it is not in the printed Catalogue, but in Smith's manuscript notes (1830-33), where it is also said to grow there with *Carex rostrata* (Bottle Sedge).

[102] E. Scott, Botanical Notes from the Ashford District, in the *Report of the Folkestone Natural History Society for 1955*, pp.14-15.

Willesborough Lees. Photo by Stephen Lemon, 16 August 2014

The only other recent records have been in Wealden woodland south of Ashford. These are at Norland Wood north of Ruckinge; Courthope Wood, Shadoxhurst; and in Bayland, Longrope and Birchett Woods, Orlestone Forest. It has been more widely known here in the past, however, having also been recorded at a pond border on Weald Clay near Spot House Farm to the west of Orlestone Forest by Dr. E. Scott in 1955. The total of 2010-24 records is seven monads (six tetrads), well exceeding the single tetrad of Philp (2010) for 1991-2005.

***Carex canescens* Kent records to 2024**
mapped at tetrad level,
from BSBI database.

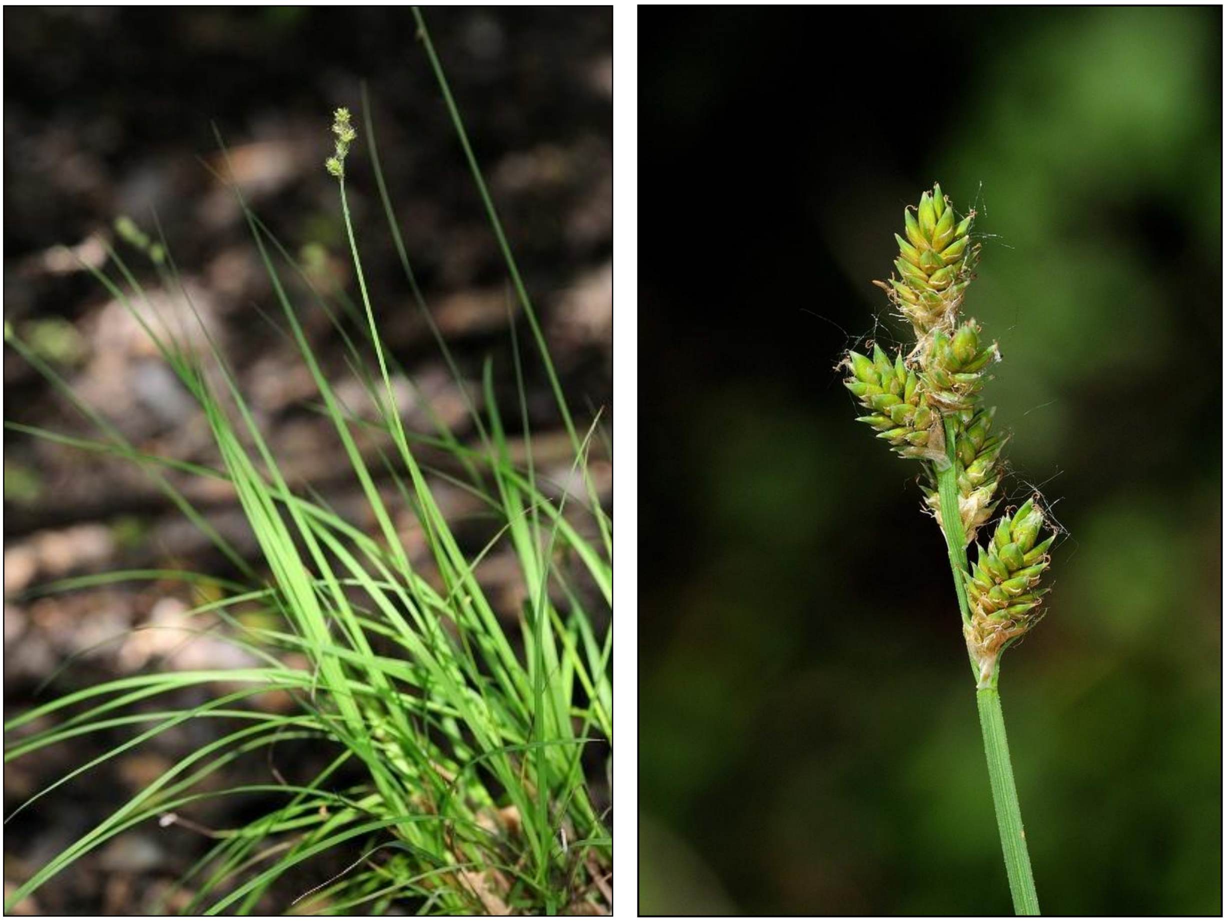


Carex canescens is generally regarded as a plant both of high altitude nutrient-poor mires and of lowland mesotrophic bogs. At Willesborough Lees it grows in modified valley bog. In Orlestone Forest it grows on the margins of shaded woodland pools and on small islands of peat-covered tree roots. The Norland Wood site has some similarities as this comprises a series of peaty/muddy woodland pools; also the Courthope Wood site is the margin of a woodland pool and an inaccessible island within it.

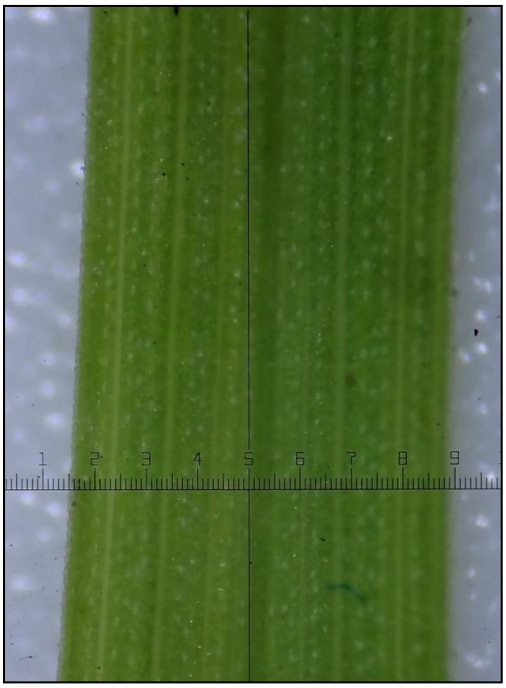
The species is distinctive for its pale whitish-green spikelets, at least when young, hence the name, White Sedge. The presence of stomata on the upper leaf surface is a characteristic which, amongst Kent sedge species, is shared only by *Carex rostrata* (Bottle Sedge) and *Carex nigra* (Common Sedge). *C. rostrata* is separable as being rhizomatous, not tufted, and the leaves of *C. canescens* are lighter green and softer in texture than *C. nigra*.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Courthope wood east, Shadoxhurst	TQ9636		9 May 2015	SL & SB	TQ 96914 36294, at least 10 clumps on edges of and on inaccessible island at pond not mapped on OS map, also contained *Riccia fluitans* (Crystalwort). Tussocks included another GPS reading, of TQ 96884 36269.
Bayland Wood, Orlestone Forest	TQ9735	Access land	20 August 2021	KBRG meeting	Six plants by a shaded and peaty woodland pool close to the edge of a ride at TQ 9795 3584.
Longrope Wood,	TQ9835, TQ9836	Access land	(1) 20 August 2021 (2) 17 September	(1) KBRG meeting	(1) Three plants at TQ 98248 36005 on the margin of a shaded pool.

Orlestone Forest			2019 (3) 9 May 2015 (4) 24 May 2011	(2) SB (3) SB, SL (4) JA, LR, SB	[Forty plants were recorded at this pool in May 2011.] (2) A few plants with sphagnum in a shaded peaty pool in Birchett Wood, TQ 98857 35756. (3) Two tussoscks at margin of woodland pool at TQ 96884 36269, a total of at least ten clumps around pool and on inaccessible island, TQ 96914 36294, pool also contained *Riccia fluitans*. (4) (a) TQ 98206 35834, six plants on small islands made of peat-covered tree roots in a shaded woodland pool. (b) TQ 98230 36005, c. 40 plants both on the margins of a shaded woodland pool and on islands made of peat-covered tree roots (c) TQ 98345 35555, four plants at margin of island in large shaded woodland pool. [This is a long-known area, with ES having found it in 1955 at TQ 987 354.]
Norland Wood, Ruckinge	TR0235		(1) 28 My 2022 (2) 9 May 2015	(1) & (2) SL	(1) Kent Field Club meeting, Norland Wood, TR 0240 3516. Long pond, with large island of peat almost filling it. Single plant in moat around pond edge. (2) TR 02328 35243: at least 40 clumps in flower with *Carex elongata, Carex pseudocyprus, Carex remota* and the moss *Calliergon cordifolium*, growing on sphagnum peat in one end of a series of interconnected swampy ponds in Norland Wood. Inclining to the shade from *Betula* trees, slightly less than that from that from *Salix*, also growing in the vicinity. This area appears to have developed tree growth after clearance of conifers following the 1987 Storm.
Willesborough Lees	TR0342		(1) 1 August 2015 (2) 16 August 2014 (3) 2006 (4) 21 April 2002 (5) 2 August 1987 (6) 24 June 1977	(1) SL, LR (2) SL (3) JP (4) JW (5) EGP (6) KFC meeting	(1) Boggy area coppiced Winter 2014, most plants heavily rabbit grazed, growing with *Carex echinata*, TR 03890 42525 / TR 03926 42544 / TR 03811 42537. (2) Approximately 12 small, grazed, non-flowering plants spread over two metres in short turf below power lines at TR 03889 42527. Associates: *Hydrocotyle vulgaris*, *Potentilla erecta* and *Juncus bulbosus*. Within a larger open area created by felling trees in the previous winter. Plants possibly germinated this year following the tree felling, benefiting from combined effects of power lines and felling. (3) In very overgrown alder carr. (4) TR 039 424. (5) In small boggy area by stream; specimen in **MNE**, given as TR04G. (6) No grid reference given in meeting report, a fine patch with growth stronger than previously seen.



Orlestone Forest. Photos by Lliam Rooney, 24 May 2011



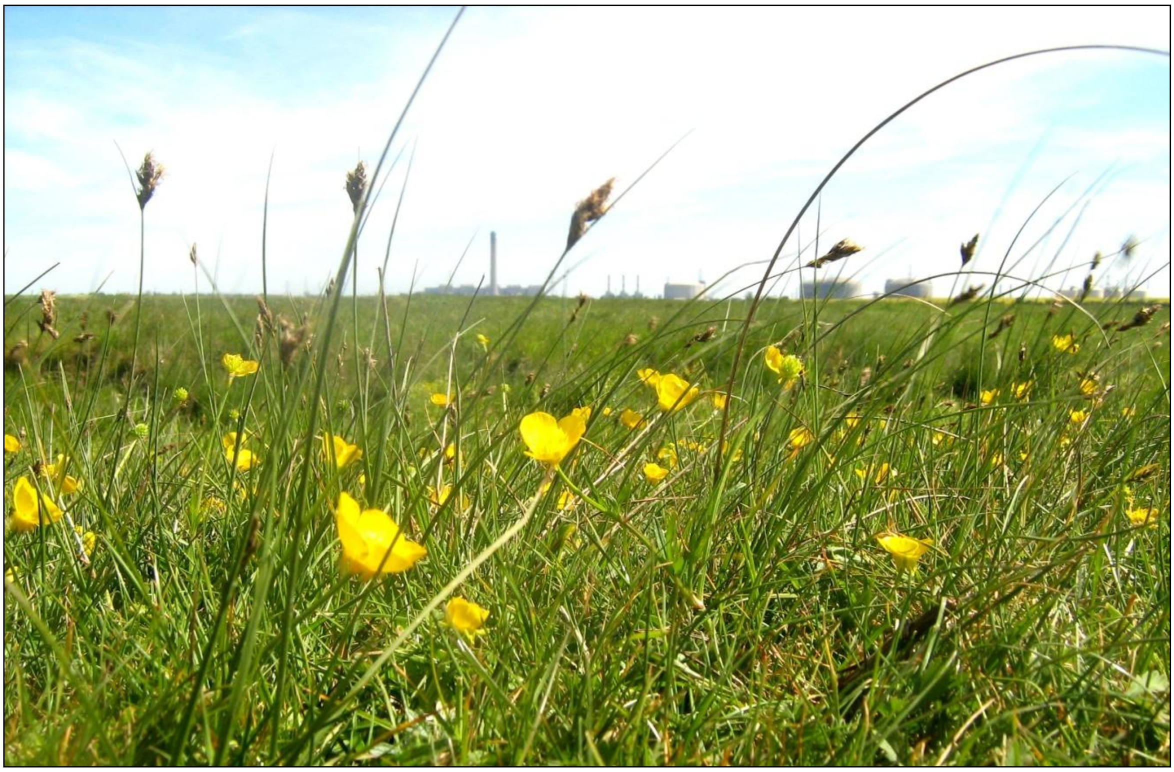
Abaxial sideof leaf, showing stomata, from Willesborough Lees material. Photo by Stephen Lemon, August 2014.

Carex divisa Huds. (Divided Sedge)

vc 15 and 16

Rarity / scarcity status

Carex divisa is regarded as **scarce** and **Vulnerable** in Great Britain, primarily a plant of the south east, with potential to be affected by coastal development or conversion of grazing marshes, and it is treated as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. In spite of this, its risk status in England is one of 'Least Concern'. Indeed, in Kent it is quite common in low coastal areas and no county designation of scarcity is appropriate, but it is listed as a county axiophyte, indicative of good habitat.



Grain marshes. Photo by Geoffrey Kitchener, 10 May 2011

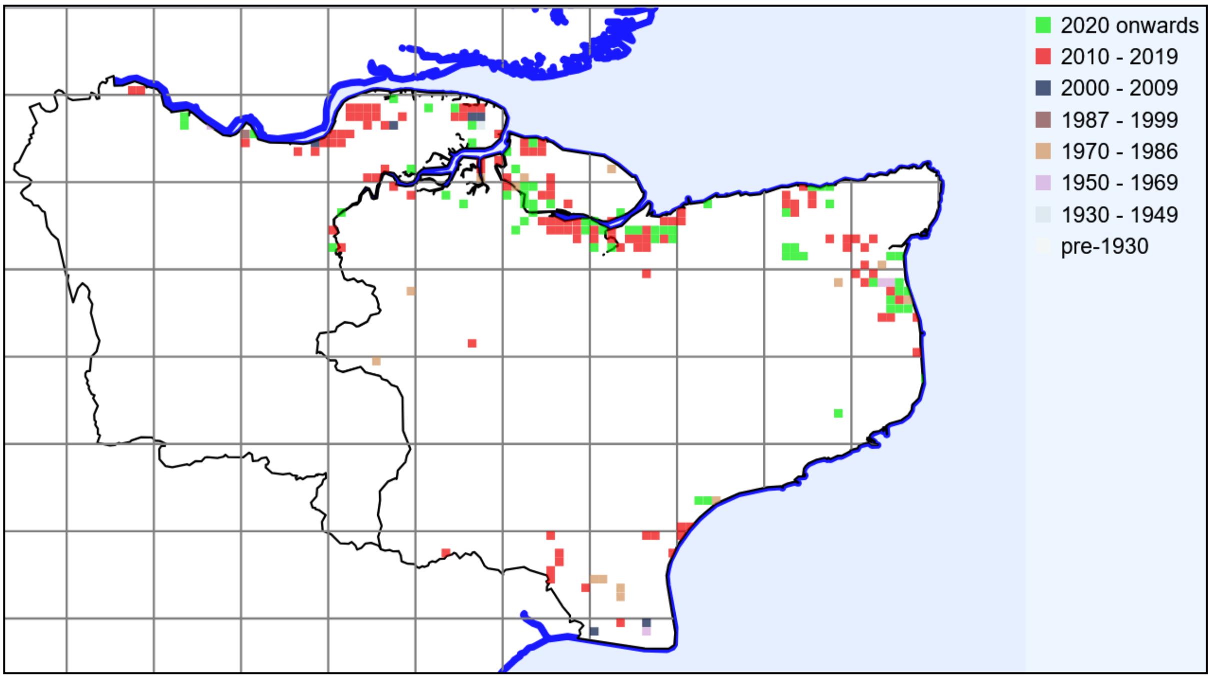
Account

In Kent, *Carex divisa* is first mentioned in John Ray's *Synopsis* (3rd edition, 1724) as the "*Marsh Cyperus-grass...with a divided head*... (by *Hithe* in *Kent; Mr. J. Sherard*)". Hanbury & Marshall (1899) regarded it as very common in the Thames valley and Romney Marsh, frequenting marshes near the sea and tidal rivers. Philp (2010) recorded it in 95 tetrads, with a primary focus on the north Kent coast from Gravesend to Whitstable. Although this is a reduction from 113 tetrads in Philp (1982), it may not represent a diminution on the ground.

Divided Sedge may typically be found on flat, somewhat brackish grazing marshes, seldom above 10 metres altitude. Francis Rose described it as to be found in pastures and on dike banks on the alluvial coastal and estuarial flats derived from former saltings. It may be at the edge of ditches or in more open areas, often in or at the margin of slight depressions, but not in permanent standing water. It forms large patches and it is often difficult to identify where one plant ends and another begins. These patches may be somewhat darker than the neighbouring sward and may be picked out from a distance, even if only vegetative. The species is distinctive by virtue of its somewhat compressed panicle, normally overtopped by the lowest bract.

Seasalter. Photo by Lliam Rooney, 7 May 2010

The Kent records are primarily coastal, but not invariably so. Nationally, inland records have been known on a historic basis, but these have largely disappeared[103]. In Kent, however, there are several atypically inland sites. Its appearance in the gutter of the M20 between Ashford and Maidstone (RD, 1975, at TQ 792 573) appears to be related to the saline habitat created by highway de-icing salt. But other post-1970 locations are not necessarily of this character: the Stour Valley at Chartham (TR15C); by the A252 between Chilham and Molash (TR0542); a wet sheep pasture at Hernhill (TR 068 599); a damp field south of Harrietsham (TQ8651); and two sites at Linton near Maidstone (TQ74P). There is also a record of cover along 150-200m of broad verge alongside the Ashford Road above Ham Street at an elevation of over 50m, and 8-10km away from any other site[104]. These records (other than Chartham) indicate an ability to grow on substrates other than coastal alluvium, as also its presence at the bottom of a disused chalk pit at Swanscombe (TQ 607 745) to which it appears to have migrated from grassland habitat (since overgrown) around the top.



Carex divisa **Kent records to 2024 mapped at monad level, from BSBI database.**

The records for 2010-24 include some sites unrecognised in Philp (2010), but the total is 108 tetrads (182 monads), well exceeding the total achieved in the 1991-2005 survey (95 tetrads), although lacking the full extent of what was earlier found on Romney Marsh, where there are either losses, presumably from land use changes, or incomplete coverage.

The records for 2010-24 include some sites unrecognised in Philp (2010), but the total is 107 tetrads (179 monads), well exceeding the total achieved in the 1991-2005 survey (95 tetrads), although lacking the full

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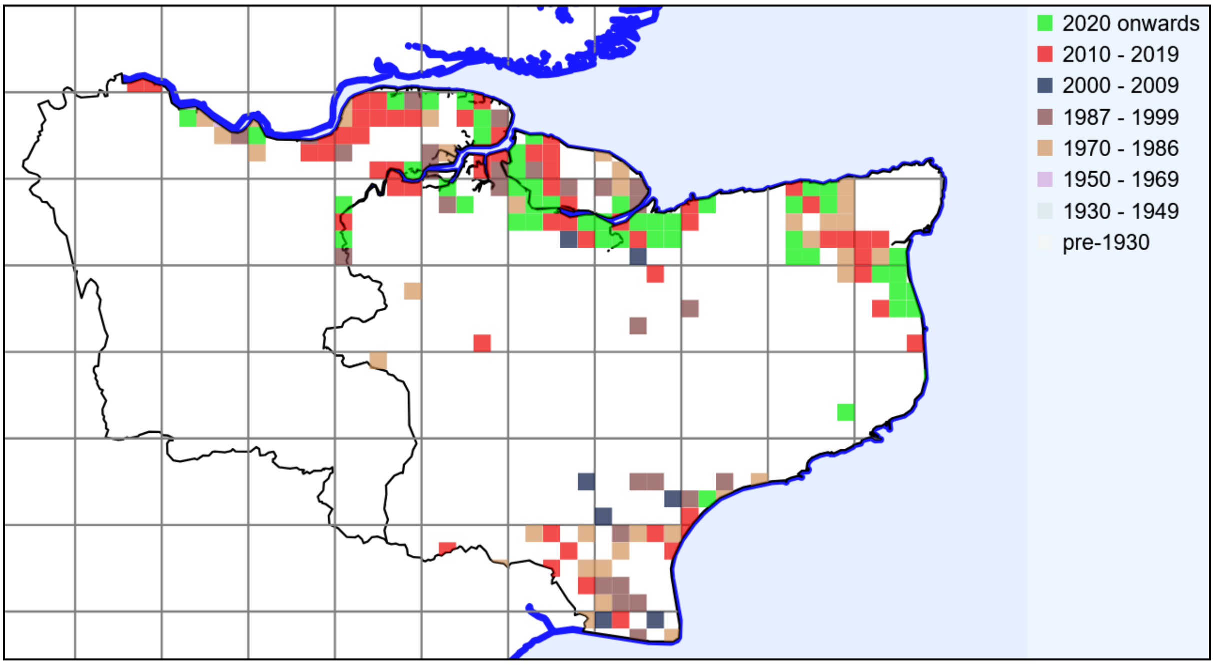
[103] It might still be worth checking the A20 verge west of Newington (Frogholt) and a roadside bank at Chilton near the source of the Dour.

[104] Moyse, R. (2001). An inland record of Divided Sedge *Carex divisa* Huds. *The Newsletter of the Kent Field Club* **48**: 6. The supposition was that it may have been introduced to the verge with top soil following road widening; associated flora was otherwise unremarkable.

extent of what was earlier found on Romney Marsh, where there are either losses, presumably from land use changes, or incomplete coverage.

We have found more in the low lying land around the Isle of Thanet, although not as much as in the 1971-80 survey (Philp, 1982). The fuller earlier recording in Romney Marsh and around Thanet is shown in the tetrad distribution map below, since recording before 2010 was more generally carried out at that level of resolution and so more data are available.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Carex divisa **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Carex echinata Murray (Star Sedge)

vc 15 and 16

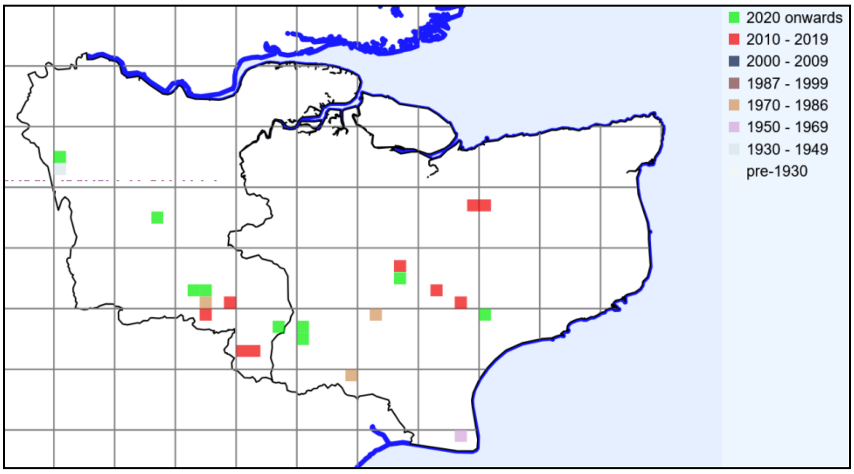
Rarity / scarcity status

Widespread in the British Isles other than in the Midlands and far south east, *Carex echinata* requires no special conservation status when considered over Great Britain as a whole, but in England its categorisation is as a **Near Threatened** species. In Kent the loss of sphagnum bog habitats has led to it qualifying as **scarce** on the basis of assessment criteria using the number of sites listed in Philp (2010), although discoveries or rediscoveries since that survey would instead rank the species as near scarce. It is a Kent axiophyte, indicative of good habitat.

Hothfield. Photo by Lliam Rooney, 19 May 2011

Account

Star Sedge was first recorded for Kent in Thomas Forster's *Flora Tonbrigensis* (1816) as sufficiently common in bogs and marshy places that any specific listing of localities was unnecessary. By the time of Hanbury & Marshall (1899), however, it was treated as rather uncommon in the county. In the mid-20th century there were still sufficient bog habitats for Francis Rose to have collected specimens (now in **MNE**) from many locations across the county[105]. However, only five tetrads are listed in Philp (2010), a decline from 11 tetrads in Philp (1982), which might be capable of interpretation as the consequence of an on-going loss of habitat. A reversal of such a trend has been shown at Pembury Walks, where the removal of conifers by the RSPB has enabled sphagnum moss to regenerate, with the Star Sedge appearing (2013) in the most open area of sphagnum.



However, the total number of Kent tetrad records for the period 2010-24 is 18, equivalent to 24 monads, and it is likely that there has been no decline since 1971-80, but that the species has been sought more intensively since 2010 (albeit that records for TQ82 and TQ93 have not been re-found).

***Carex echinata* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Carex echinata is readily identified by the mature utricles which spread out so as to form a short series of star-shaped clusters. There is a recognised plant community of which this is characteristic, *Carex echinata - Sphagnum recurvum / auriculatum* mire, although it is said that there are few constants in the community other than those species, but that grasses such as *Agrostis canina, Molinea caerulea* and *Anthroxanthum odoratum* can be frequent and the community lacks calcicolous species and the deeper swamp flora. Whilst it is a plant of wet ground, it has been seen, e.g. at Hatch Park and Gibbin's Brook, growing more at the margins of such areas. The largest Kent populations are those in the bogs at Hothfield; but in terms of the spread of records, it appears that the Bedgebury – Cranbrook – Goudhurst triangle still holds the most, although further east there is an association (from TQ94 through to TR13, and of which Hothfield is part) with the Folkestone Formation and its junction with the Sandgate Formation.

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[105] Including Moorden near Penshurst; Seal Chart; Ightham Common; Chingley Wood near Bewl; Sandway; Willesborough Lees; Dungeness; north side of Bigberry Wood; Monks Horton; Harbledown; Ham Fen. He considered the species to be locally common in moderately acid valley bogs, swamps and carrs in south west Kent and on the Greensand of east Kent.

Pembury Walks, habitat. Photo by Stephen Lemon, 21 June 2010

Site	Grid reference	Site status	Last record date	Recorder	Comments
Keston Bog (metropolitan vc16)	TQ4164	Common owned by L.B. of Bromley	(1) 16 July 2022 (2) 6 August 2016 (3) 15 July 2011 (4) 13 June 2007	(1) LNHS meeting (2) SL (3) & (4) JP	(1) Keston Bog north and south of Fishponds Road. (2) Small valley bog between TQ 4170 6423 and TQ 4171 6434. (3) TQ 41706 64285, bog, in water retained by top dam. (4) A site of long standing.
Fishponds, Seal St Lawrence	TQ5755		(1) 27 July 2024 (2) 29 August 2019 (3) 27 August 2017	(1) & (2) GK (3) SL	(1) Frequent at margins of 4th pond S of A25, damp peaty ground just above water level. (2) At least 22 plants along bank (northern and western) of next to southernmost of the old fishponds, now in woodland. *Molinea caerulea* also present. (2) Fish Ponds Wood, Ightham Common, 4th pond south of road, TQ 5793 5541 / TQ 5793 5541. Around boggy northern edge of pond. Not detected in adjacent ponds. Site known to FR (as peaty ponds in Rose Wood) 1944-62.
Pembury Walks	TQ6242	RSPB reserve	(1) 30 May 2020 (2) 5 April 2014 (3) 21 June 2013	(1) SL (2) SP & DG (3) SL	(1) Pembury Walks, west of pumping station, sphagnum flush running north-west, TQ 6203 4236. (2) - (3) In sphagnum bog on valley slope above stream, TQ 6211 4235, a cluster of plants with a few singles nearby, confined to an open area of sphagnum surrounded by regenerating birch/willow. The species was also recorded at Pembury Woods (grid reference not known) in a KFC meeting on 6 July 1985.
Old Swan Farm, Lamberhurst	TQ6438		(1) 9 July 2000 (2) 6 July 1999	(1) AC (2) JP	(2) TQ 649 388.
Brenchley Wood	TQ6442	KWT managed reserve	(1) 19 May 2024 (2) 14 October 2023 (3) 14 June 2010 (4) 13 August 2005	(1) KBRG meeting (2) KFC meeting (3) SB (4) JP,BW	(1) Abundant in Brenchley Wood sphagnum bog TQ 646 421. (2) Sphagnum bog in Brenchley Wood KWT reserve TQ6470 4219 (3) Occasional in sphagnum bog. (4) TQ 649 423. [Also given in the next tetrad, TQ64K, in Philp (1982)]

Capel	TQ6443		22 May 2019	GK	TQ 64179 43881, at utility pole with pheasant feeding barrel attached, colony of scattered plants extending eastwards along swampy valley of Alder Stream, to TQ 64190 43888. At least 28 plants scattered through *C. paniculata* colony, where vegetation lower and less dense. Location below power lines, where scrub/trees subject to clearance.
Old Swan Farm, Lamberhurst	TQ6538		13 June 2015	KBRG meeting	TQ 6511 3882, c. eight plants at spring-line where alders are cut back below power lines. Associated spp included *Carex laevigata, Cirsium palustre, Juncus effusus, Lotus pedunculatus, Alnus glutinosa*.
Horsmonden	TQ64V		(1) 15 June 2013 (2) June 1978	(1) SL (2) JL	(1) TQ 69276 40933, south of Furnace Pond, a plant with three spikes on a small patch of sphagnum in boggy area of Shirrenden estate, probably benefiting from recent coppicing. (2) Furnace Pond, recorded by FR in 1954 as sphagnum bog by lake.
Bedgebury Forest	TQ73B &G (TQ7133, TQ7232, TQ7332, TQ7333)	Access land	(1) 13 July 2019 (2) 28 August 2016 (3) 26 July 2016 (4) 5 September 2015 (5) 2 July 2015 (6) 29 May 2014 (7) 29 July 2013 (8) 10 August 2011 (9) 28 July 2011	(1) SL (2) SL (3) SB & OL (4) SB (5) SL (6) SB (7) JP (8) SB / KBRG meeting (9) SB	(1) (a) Bedgebury Forest, boggy alder carr above Louisa Lake, TQ 7324 3302. (b) Bedgebury Forest, Katies Pond, shady eastern edge, TQ 7230 3293. A few plants. (c) Bedgebury Forest, spring flowing into western side of Louisa Lake, TQ 732 328. (2) Salix/Rhododendron swamp (mostly densely shaded) bordering northern end of Louisa Lake, TQ 732 329. (3) Stone Hole Pond at TQ 73513 33684. (4) A few plants on sphagnum beside lake at entrance to Pinetum, TQ 71587 33293. (5) Swampy bog on slope fed by main stream beside track, TQ 72114 33244, group of plants. (6) In a very wet area by Marshalls Lake at TQ 72039 33805 with *C. remota*, *Veronica beccabunga*, *Ranunculus flammula*. (7) TQ7332. (8) About 12 plants beside lake TQ 73222 32932. (9) Wet, wooded area near Louisa Lake TQ73247 33028; also several plants by small ditch TQ 73129 32692.
Bedgebury Park School	TQ7234		6 June 1997, 12 May 1999	JP	TQ 724 344, Bedgebury Park School. Resurveyed in 2010, but boggy area on south of lake was very overgrown with sallows and young alders.
Angley Wood, Cranbrook	TQ73N, TQ73T, includes TQ7636		(1) 26 June 2022 (2) 11 July 2018 (3) 12 July 2015	(1) & (2) SL (3) KBRG meeting	(1) Angley Wood, TQ 7659 3652. Peaty edge of damp track at lowest point. Single plant. (2) Angley Wood, Burnt Bank Wood, shady sphagnum bog under birch coppice, TQ 76199 36742. Two clumps, growing together in a different area to the plant recorded in 2015. (3) Angley Wood, a single plant at

					TQ 76478 36819. Seen also by SL on 3 July 2015 recorded as in *Betula*-shaded spring flushes on slope above main alder carr. Also recorded in Angley Wood by FR in 1955 as in sphagnum bog at edge of fen, Tuckers Pond.
Hemsted Forest	TQ8135	CROW access land	(1) 31 July 2021 (2) 21 July 2021	(1) SL (2) SB	(1) Farningham Wood, TQ 8138 3519. Pine plantation with scrubby flushed ditches running down slope. (2) in a wet flush on a narrow path at TQ 81277 35500.
Chittenden Wood, Hemsted Forest	TQ83D, includes TQ8136, TQ8137	CROW access land	(1) 15 August 2021 (2) 21 July 2021 (3) 6 August 2017 (4) 14 July 2016 (5) After 1970, before 1981	(1) SL (2) SB (3) SL (4) JP (5) Philp (1982)	(1) Chittenden Wood, TQ 8190 3678. Boggy scrub developing in open north-south ride between pine plantations. Widespread further south along ride. (2) On sphagnum under western hemlock plantation at TQ 81764 36311. (3) Hemsted Forest (Chittenden Wood), sphagnum filled pond in mature plantation, TQ 819 370. Scattered plants. (4) TQ 817 366, edges of ride. (5) TQ83D. Also recorded by FR in 1944 in a boggy ride.
Hothfield Common	TQ9645 & TQ9646, TQ9745	KWT managed reserve, SSSI	(1) 23 June 2022 (2) 2 June 2019 (3) 21 May 2016 (4) 8 August 2015 (5) 9 September 2011 (6) 25 May 2010 (7) 12 July 2000	(1) AL (2) AWi (3) SL (4) BW (5) SB (6) GK (7) JS	Present before 1899. (1) TQ 968 456. (2) TQ9645. (3) Flushed boggy grassland in northern bog, TQ 9661 4600. (4) TQ9645. (5) TQ 96748 46101, sphagnum bog, Hothfield Common. (6) Abundant in main and southern bogs, TQ9645, and frequent in northern bog, TQ9646. (7) TQ 969 456.
Dungeness	TR01	RSPB reserve	2003	JP	In cleared area on west side of main sallow area. Associated species included *Carex nigra, Ranunculus flammula, R. lingua*.
West of Chartham Hatch	TR05Y		After 1970, before 1981	Philp (1982)	May be same as the following TR0956 record. Philp (1982) has a further record in the adjoining tetrad, TR15D.
Willesborough Lees	TR0342		1 August 2015	SL, LR	Boggy area coppiced Winter 2014, most plants heavily rabbit-grazed, growing with *Carex canescens*, TR0389042525 / TR0392642544.
Hatch Park	TR0640	SSSI	21 July 2016	KBRG meeting	(a) c. TR 0648 4067 scattered, and in places frequent, towards margin of mire at eastern end of Boating Pond. (b) TR 06684 40631, one plant at north east margin of Heron Pond, damp rising ground close to fringing bracken.
Hunstead Wood	TR0956		(1) 7 June 2015 (2) 31 May 2014 (3) 12 June 2010	(1) LR (2) BW (3) LR	(1) Two clumps in Alder carr in sphagnum at TR 09283 56864. (2) Same as 2010 sighting. (2) Hunstead Wood, TR 094 568. Also recorded at this wood by FR in 1956 in a bog amongst alders.
Bigbury	TR1057, TR1157	KWT reserve	18 August 2018	SL	Howfield/Bigbury Woods, north of Bigbury Road, western quarter of Bigbury KWT Reserve: (a) TR 10994 57600. Two metre sprawling patch with remains of

					inflorescences on wet ground under *Alnus.* (b) TR 11005 57642. Spring flushes on north facing slopes of Thanet Formation under *Alnus*. Two small fruiting clumps at edge of boggy spring flush with *Carex paniculata*, *Juncus bulbosus* and *Pellia*, in vicinity of *Hookeria lucens*. Location of the Maidstone Museum herbarium specimen collected by Francis Rose from the north side of Bigberry Wood.
Gibbin's Brook	TR1138	CROW access land, SSSI	(1) 28 June 2023 (2) 6 June 2020 (3) 30 June 2013 (4) 17 July 2011	(1) KBRG meeting (2) SL (3) KBRG meeting (4) KFC meeting, communicated by JP	(1) Gibbin's Brook. (2) Gibbin's Brook, north-east of Sellindge, TR 1158 3852. Shrinking areas of open base rich fen formed over peat in area south of pond, now ungrazed, going rank and scrubbing over. (3) In the bog north of the road across Gibbin's Brook, frequent along the eastern margin, where more open/drier, but sphagnum forming (TR11637 38673 north-eastwards). In the bog south of the road, it was very abundant over a wide area, this being relatively drier and more open. (43) -

Hothfield
Photos by Lliam Rooney,
19 May 2011
and 4 July 2010

Carex elata All. (Tufted-sedge)

vc 15

Rarity / scarcity status

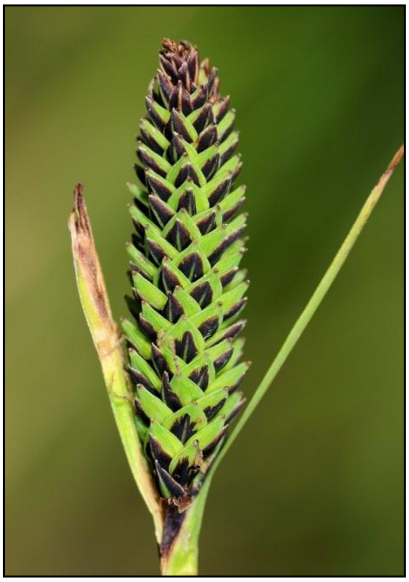
Widespread in England, Wales and Ireland, Tufted-sedge's conservation status over Great Britain as a whole is one of 'Least Concern'. However, a trend of decline in England has led to it being considered as **Near Threatened**. Its main strongholds lie no further south than East Anglia, and in Kent it is very local, mainly in the Worth / Hacklinge area, but also at Preston Marshes and Dungeness, and so it is treated as locally **scarce**. It is also a Kent axiophyte, indicative of good habitat.

Worth. Photo by Sue Buckingham, 19 April 2011

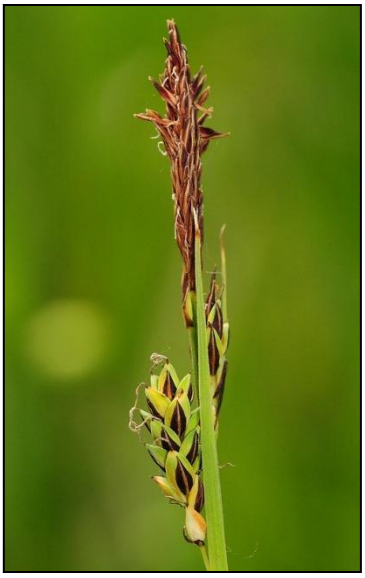
Account

The first Kent record for *Carex elata* was by J. T. Boswell-Syme in *The Phytologist* (1855), when he noted it as "abundant near Sandwich and Deal". Hanbury & Marshall (1899) assessed it as the commonest sedge in the low-lying ground stretching northwards from Deal nearly to Pegwell Bay, where it occurred in the greatest profusion.

This does not seem to have remained the case north of Sandwich, and Philp (1982 and 2010) noted it no further north than TR35I, N and T which (together with TR35H and M, all contiguous tetrads in the area of Ham, Worth, Hacklinge and the Lydden Valley) were thought (per Philp, 2010) to constitute the only area in which it was to be found in Kent. However, it appeared to have been overlooked that Francis Rose[106] gave this species in a list for Wingham Fen, whose flora was said to be highly reminiscent of that of fenland at Worth Minnis. It transpired that this similarity extended further downstream, as in 2016 a KBRG meeting found the sedge by a ditch at Preston Marshes, some 500m from the confluence of the Wingham River and the Little Stour. There was also a single plant of the rare hybrid with *Carex acuta* (Slender Tufted-sedge), *Carex x prolixa*, a first Kent record.



Carex elata, Worth. Photo by Lliam Rooney, 30 April 2012



Carex x *prolixa*, Preston. Photo by Lliam Rooney, 5 July 2016

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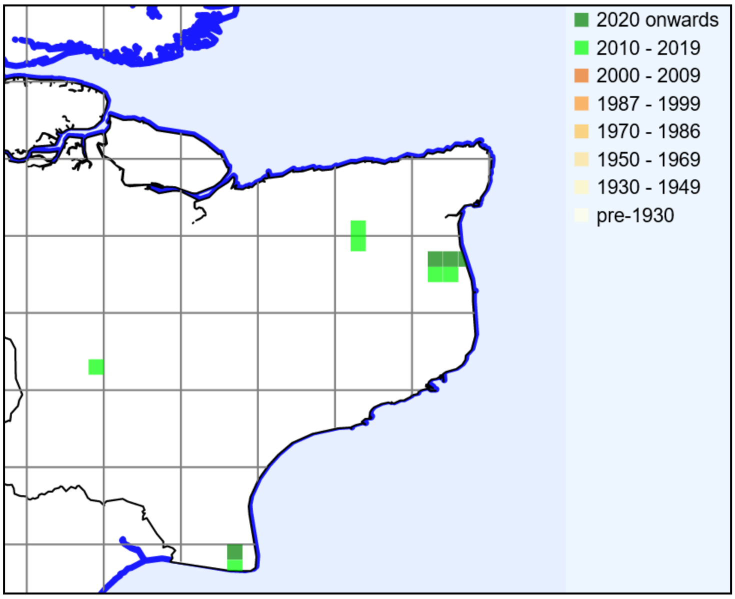
[106] Rose, F. (1950). The East Kent Fens. *Journal of Ecology* **38**: 292-302.

In 2010 the species was identified as present also in a wet area of a freshwater lake on the Dungeness shingle where the plants had been known for some years, but had not been recognised as *Carex elata* – a significant extension of its distribution, as understood up till then. It transpired that this is not the only Dungeness site. In 2018 it was also found to be present round a cluster of peaty ponds near Smarden, an even more unexpected site. The 2010-24 total is 13 monad records (ten tetrads), whereas the Philp (2010) total for 1991-2005 is four tetrads. The trend probably represents more intensive recording, rather than any expansion.

Carex elata **Kent records to 2024 mapped at tetrad level, from BSBI database.**



Tufted-sedge in north east Kent forms large tussocks at the margins of dykes, sometimes near continuously along the lower parts of the dyke banks. In Ham Fen, however, it is not so much a marginal plant as a component of open swampy willow carr; and this is echoed in its occurrence at Dungeness in an area cleared of willow, where it grows in a swamp on a peaty substrate subject to variable inundation, both seasonally and from year to year.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Smarden	TQ8943	Local Wildlife Site	21 May 2018	LM, SL	Smarden, Dering Meadows, north of Pluckley Road. Two ponds in hedgeline dominated by *Salix* and divided by ancient woodland bund, TQ 8945 4317 to TQ 8953 4323. One larger pond beside the other two, forming the north eastern side of a field and dominated by high canopy trees, TQ 8954 4319. Twenty tussocks growing on the flooded peaty bottom of the southernmost of the two ponds, many tussocks with inflorescences, especially those along the open northern edge. Adjacent pond with at least 25 tussocks of various sizes, many in *Salix* shade without inflorescences but very robust tussocks with inflorescences on a floating mat of peat at edge of open water. Largest pond with three large flowering tussocks along its open southern edge. Specimen confirmed by Mike Porter. *C. elata* colony is self-sustaining and coping with the *Salix* shade. Not obviously derived from planted stock but cannot rule this out. Largest pond has been cleared/excavated in the past, perhaps 20-30 years ago, with no obvious peat and steep rather than sloping edges. It also has a small red flowered water-lily, probably introduced much more recently. *C.*

					elata sufficiently well established to suggest its origin pre-dates the clearance/excavation work in the largest pond, especially if the bund separating the southernmost pond serves to slow down seed dispersal by water. Aerial imagery shows southernmost pond to have had some tree cover back to 1940s and soon after to have become dominated by trees. Aerial imagery of adjacent pond in 1940s much more open, becoming progressively tree dominated in recent times but always retaining some open water. Aerial imagery of largest pond shows tree cover from 1940s onwards with a little less in recent years. *C. elata* not found in other large ponds in this immediate area which also show signs of excavation in the last 20-30 years.
Dungeness	TR0717, TR0718	NNR, SSSI	(1) 20 June 2020 (2) 10 July 2016 (3) 15 June 2010	(1) SL (2) KBRG meeting (3) GK & RG	(1) Open Pits, TR 0723 1827. Wet marsh at the western end of Pit 8. (2) TR0717, Open Pit no. 1; TR0718, Open Pit No. 8. (3) TR 072 182, five tussocks, one perhaps a multiple tussock, in wet area of pit no. 8 with *Iris pseudacorus,* where cleared of *Salix*. See *Kent Botany* 2010.
Preston Marshes	TR2360	SSSI	5 July 2016	KBRG meeting	A number of plants along the margins of a ditch at TR 232 600 and at TR 2335 5995.
Ham	TR35H, includes TR3354, TR3355	KWT reserve, SSSI	(1) 19 July 2017 (2) 13 July 2013 (3) 18 May 2002 (4) 1982	(1) SL & SB (2) KFC meeting (3) EGP (4) ACH	(1) Ham Fen. A few small non-fruiting plants at TR 3305 5529 in shallow water on calcareous peat. (2) Six plants recorded in true fen at TR 33443 54925 and TR 33448 54918, probably more plants in the vicinity, obscured by thick vegetation. Associated flora included *Thelypteris palustris, Carex paniculata, C. acutiformis* and *C. riparia*. (3) recorded only as TR35H. (4) TR3354, west of Hacklinge; and TR3355, near Ham Brooks wood.
Sandwich and Worth	TR35I, includes TR3356, TR3357		(1) 19 April 2021 (2) 3 June 2010 (3) 1982	(1) SB (2) GK (3) ACH	(1) Confirmation of continued presence of large population from TR 3399 5672 north-westwards on both sides of Delf ditch to TR 33938 56769 and also eastwards along the Delf from the first point into TR3456. Additionally, two large old tussocks were seen at TR 33585 56861 alongside ditch and bridleway. (2) Banks of watercourse from TR 33317 57097 to 33127 57401, thence alongside Deal Road / Dover Road to TR 33123 57655 (almost as far into Sandwich as the railway). Also frequent on banks of the Delf from TR 33990 56724 to TR 33867 56818, then TR 33675 56748 (where watercourse moves away from road and visibility). (3) TR3356.north of Worth Hill.
Worth	TR35M, includes TR3455, TR3555	Includes SSSI	(1) 5 September 2013 (2) 19 April 2011	(1) RG, LR & GK (2) SB	(1) TR 348 559, several plants alongside Pinnock Wall dyke. (2) Margin of marsh dyke at TR

			(3) 1982	(3) ACH	3422 5566, Worth Minnis (3) TR3455, near Hacklinge and TR3555, Lydden Valley.
Worth	TR35N,includes TR3456, TR3556		(1) 12 August 2023 (2) 19 April 2021 (3) 5 July 2011 (4) 19 April 2011 (5) 3 June 2010 (6) 22 June 2002 (7) 1982	(1) KFC meeting (2) SB (3) KBRG meeting (4)SB (5) GK (6) EGP (7) ACH	(1) RSPB Lydden Valley, ditch between compartments 46 and 47. (2) [see TR35I] (3) On bank of The Delf dyke TR 34446 56518. (4) Plentiful alongside northern extension of Delf dyke from Brewers Bridge TR 34412 56685. (5) TR 34000 56722 and eastwards along the banks of the Delf (6) Old Downs Farm, TR35N. (7) TR3456, near Temptye; and TR3556, east of Blue Pigeons.
Worth / Lydden	TR3655 (35S)	SSSI	16 July 2008	CJC & AP	One tussock, south bank of ditch, Willow Farm, TR 3616 5526.
Sandwich Bay / Lydden	TR35T, includes TR3657, TR3757		(1) 23 May 2022 (2) 19 June 2020 (3) 13 April 2017 (4) 1991-99	(1) KBRG meeting (2) SB (3) SB (4) EGP (Philp, 2010)	(1) (a) Plenty of tussocks TR 3625 5726, in a long damp hollow the remnant of an attempt in 1550s to build a channel connecting Sandwich town to the sea. (b) Sandwich Bay Estate, short open section of Old Haven, south of housing and former Hotel, TR 363 571. Large tussocks. (2) Tussocks in an elongated dune slack in a part which floods each winter, TR 3632 5725. (3) A good number of tussocks in dune slack with *C. riparia* at TR 3625 5726. (4) TR35T.

Dungeness. Photo by Bob Gomes, 2010.

Worth. Photo by Lliam Rooney, 30 April 2012

Carex elongata L. (Elongated sedge)

vc 15 and 16

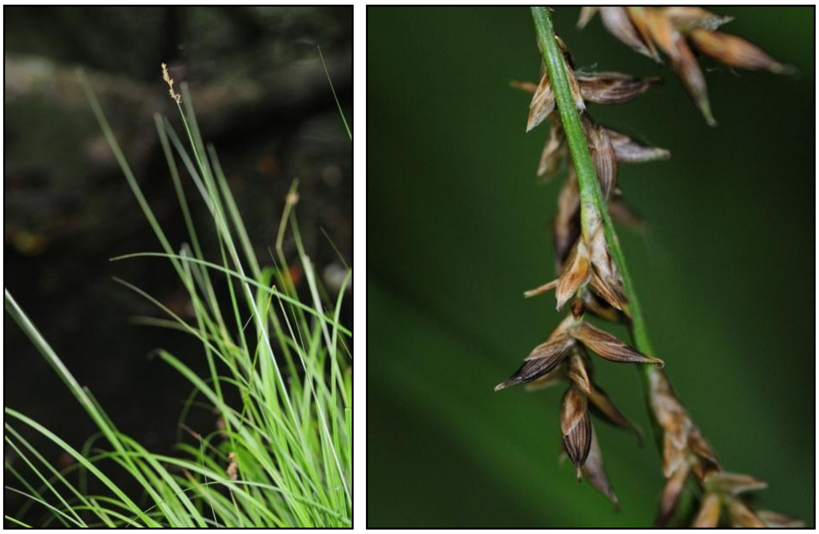
Rarity / scarcity status

Carex elongata is nationally **scarce**, scattered and not particularly common in Wales, north Ireland and some parts of Scotland and north west England. It is locally present in south east England, and as its populations in Great Britain have been broadly stable since 1930, it is not regarded as being at risk in Great Britain as a whole. However, in England it is considered as being **Near Threatened**. In Kent it has always been regarded as rare and the indications were that it was perhaps increasingly so, with only one record in Philp (2010). Hence in the first issue of this account, the species was regarded as rare in West Kent and perhaps gone from East Kent. However, the checking of old sites and some new discoveries have resulted in it being now classed as **scarce** in the county. It is also a Kent axiophyte, an indicator of good habitat.

Leigh. Photo by John Buckingham, 23 April 2011

Account

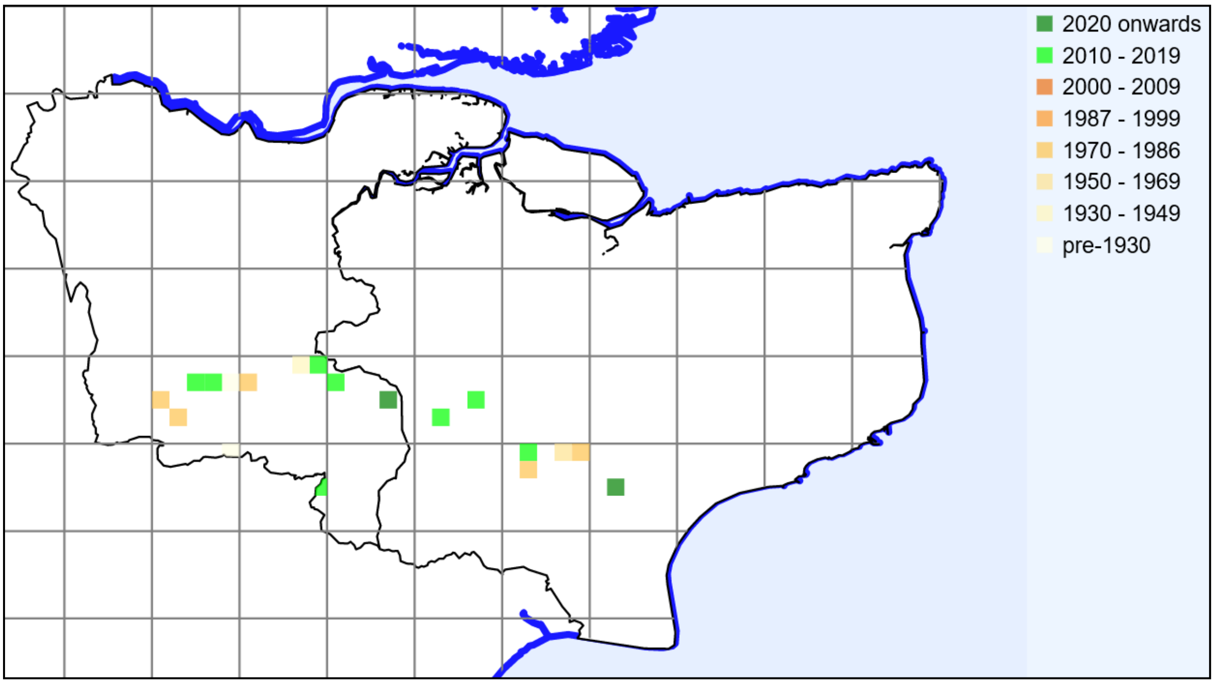
Elongated Sedge was first published as present in Kent in H.C. Watson's *Topographical Botany* (1874). It had, however, been identified as present in the county before then, as it was collected by W. Borrer at Tonbridge in May 1844. There is a handful of 19th century records, mostly around Tonbridge on Weald Clay, where Hanbury & Marshall (1899) referred to it by rivers and ditches, and in damp copses – very rare in the county, although claimed to be plentiful in Tonbridge Marshes. Early East Kent records are fewer: Wolley-Dod claimed it from Ham Marshes in 1892 and E. Bartlett (the Maidstone Museum curator) found at Maidstone in 1882 a plant which is still at the Museum, although neither of these records featured in Hanbury & Marshall (1899).



Leigh. Photos by Lliam Rooney, 7 June 2011

Dick David (in a letter to Francis Rose) summarised the status of the species in Kent after a weekend exploration in June 1968. It was, he considered, the most precarious of British sedges, and 'tragically diminished in the Tonbridge marshes', with only three clumps seen. He missed it near the railway bridge above Tonbridge, but found it securely established south of Yalding station and still present at Stubbs Cross. Philp (1982) lists the sedge for five tetrads across the administrative county, but in the later survey (Philp, 2010) only one extant site could still be traced, despite disproportionate search – this was at Leigh, near Tonbridge (TQ54T). It since transpires that this is not the only surviving Kent location; and during 2010-24 it was seen in ten tetrads (11 monads) spread across the Weald, as shown in the accompanying distribution map.

Carex elongata **Kent records to 2024 mapped at tetrad level, from BSBI database.**



It is a densely tufted sedge, in Kent found in boggy woodland, ditches, riversides and pond margins, often perched as a tussock on a root or dead wood, not in the wettest areas, but affording root access to water. Its requirements are exacting: minimum competition and abundant moisture without water-logging.

It may be recognized by the rigidly angled zig-zag spikes of the inflorescence, with dark brown mature fruits, whose clearly ribbed utricles arch outwards. In a vegetative state, the yellow-green leaves arching outwards from the compact tuft are distinctive.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Penshurst	TQ54C		1944	FR	River Eden at Gilridge [and so may be TQ5144] – FR in 1944 referred to a small marsh on a hillside. Could not be found by RD in 1973, nor by SL in 2013.
Leigh, near Tonbridge	TQ5546		(1) 4 May 2019 (2) 25 April 2015 (3) 8 June 2013 (4) 7 June 2011 (5) 27 June 2010 (6) 9 May 2010	(1) SL (2) BW (3) SL (4) SB & LR (5) LNHS meeting (6) SB	(1) Leigh Pasture and Marsh (SE54), KWT Survey. woodland, marsh and swamp, between TQ 55634 46164 and TQ 55984 46203. 161 of the 162 tussocks located at the site. (Recorder has separate spreadsheet for grid references.) The majority of tussocks grow on live and dead timber in shallow water, under shade of *Salix cinerea* with few other herbs present, but absent from the deepest shade. (2) (3) Many tussocks usually in small groups at the edges of ponds, spread over wettest parts of the woodland, first noted at TQ 55745 46193 with two very large tussocks rising from the water at TQ 55927 46177. (4) Six large tussocks in partially shaded marshy area, TQ 55727 46125. (5) TQ 55722 46115, 16 plants with *C. vulpina* and other *Carex* spp. in a

					very wet shaded marsh. (6) TQ 55765 46194, One plant only on margin of woodland pool, about a hundred yards away from the LNHS meeting site.
Leigh, near Tonbridge	TQ5646		23 April 2011	SB	One plant by stream in wet woodland, TQ 56006 46189. There may be a relationship with a 1972 record by RC in a swampy copse near Ramhurst Manor.
Tonbridge Marshes	TQ6047		1972	RD	TQ 603 472, first ditch north of river and 20 yds west of gate to Tanyard farm track. Formerly common on marshes (FR).
Yalding	TQ6849		(1) 6 July 2013 (2) 1 May 2010	(1) SL (2)KFC meeting, communicated by JP	(1) Close to a pond along a boardwalk through some wet woodland (centred at TQ 68550 49702), there were 14 tussocks west of the boardwalk and a further 19 tussocks eastwards. (2) Open, swampy willow carr. Seen 1972 by RD at TQ 681 495 on both sides of railway, but in 1986 not on the west side. It is likely that the T64Z record in Philp (1982) also belongs here.
Scotney estate	TQ6935	SSSI	12 August 2017	SL	Kilndown Wood, small basin-shaped ghyll bordering western edge of wood, steep sides and a wide flat floor, with a chalybeate spring (depicted on OS map) at fault line/junction of the Tunbridge Wells Sand and Wadhurst Clay, TQ 69372 35487. Approximately 20 scattered plants forming tussocks, growing in very wet alder carr with *Scirpus sylvaticus*, *Carex remota* and *Carex vesicaria*.
Yalding (Benover)	TQ7147		(1) 15 May 2014 (2) 29 March 2014 (3) 19 July 2013 (4) 18 June 1987	(1) GK (2) & (3) SL (4) RF	(1) 18 plants in slightly raised locations within wet wooded roadside area from TQ 71023 47633 to TQ7 1015 47604. (2) A revisit to site along B2162 where recorded in 2013. Now 14 plants (perhaps more visible as other vegetation not yet grown up), ranging in size but none very large, on raised tussocks, all associated with the root plates of trees. All on the same side of the road where found in 2013, although some newly found were slightly further south along the same pond/ditch system than before, TQ 71014 47605. (3) TQ 71025 47627, western side of Benover Road, three tussocks, close to each other along the edge of a shady ditch and near the entrance of a culvert connected to pond and ditch on other (eastern) side of road. Other sedges present were *Carex remota, C. pseudocyprus, C. pendula and C. riparia*. (4) TQ 711 476 (but probably should have been TQ 710 476), Benover Road; pond and ditch east of road by orchard; at least 40 clumps present. Associates included *Carex vesicaria, Oenanthe aquatica.* [Not found July 2013, SL. Pond may have been dug out and is

					surrounded by rank vegetation.]
Marden	TQ7644		(1) 11 June 2023 (2) 15 June 2022 (3) 24 May 2020	(1) LC (2) KBRG meeting (3) SL & LC	(1) Wet Wood, n of railway, known site, 16 plants counted, all close together. (2) North. of railway, TQ 7625 4469, as found in 2020, with tussocks lining the trunk of a fallen willow at pond margin in wet wood. (3) Wanshurst Green, east of Marden, TQ 7624 4469. Wet woodland with old pits, east of Battle Lane. Twelve tussocks in a line along a fallen crack willow trunk at the edge of a pit.
Waterman Quarter	TQ8342		(1) 13 May 2023 (2) 24 July 2013 (2) 13 June 2000	(1) SL (2) & (3) JP	(1) TQ 8334 4268. In middle of three ponds in southern half of wood on west side of minor road. 10 tussocks. Fruiting. (2) At least 4 clumps in relict heavily shaded wet wood (with alder, ash, oak and service tree) at TQ 837 426. Also another clump in a similar scrap of woodland at TQ 838 425. (2) TQ 835 427.
East of Headcorn	TQ8644		31 May 2014	SL & LR	Pond with unshaded bank along public footpath, TQ 865284 4410. Single large seeding tussock. Pond also contained rare liverwort *Ricciocarpus natans*.
Maltman's Hill	TQ8943	Local Wildlife Site	2001	JP	c. TQ 894 432, Dering Meadows, where there is a series of ponds.
South of Bethersden	TQ9237		13 June 1985	RD	Cuckold's Corner, west of Plurenden Manor, TQ 925 373, 11 or 13 plants in east sector of pond, mostly on boles or submerged *Salix* trunks. Tipping may affect. Found by LBB in 1976. May be same as TQ93I, in Philp (1982).
South of Bethersden	TQ9239		(1) 5 July 1989 (2) 1 June 1987	(1) RD (2) RF & LBB	TQ 927 391. Wet hollow in *Carpinus* woodland. May be same as TQ93J, in Philp (1982). [Not re-found (SL, 2015) and may have been affected by overshading.]
Kingsnorth	TQ9838		(1) 6 July 1987 (2) 6 May 1979	(1) RF & MW (2) RD	(1) & (2) Blindgrooms, Stubbs Cross, TQ987382, pond at north west corner of wood, 21 plants. (1) 14 plants on north side; two on south. [May be same as TQ93Z, in Philp (1982).] There is another Stubbs Cross site, TQ 985 394, middle of wet carr on west side of pool in field; two clumps seen by LBB in 1976. [At both sites, not re-found (SL, 2015) and may have been affected by overshading.]
Ruckinge	TR0235		(1) 28 May 2022 (2) 27 June 2015 (3) 9 May 2015 (4) June 2013	(1) SL (2) GK (3) SL (4) JP	(1) Kent Field Club meeting, Norland Wood, TR 0226 3526. Group of swampy ponds. Scattered plants seeding on three ponds (2) Around a series of shaded woodland ponds cut through by Saxon Shore way. Survey incomplete, but several tussocks seen at c. TR 02322 35234 (with *C. canescens* present here as well), six tussocks seen at TR 02288 35488, three at TR 02292 35246, four at TR 0266 35262, three at TR 02260 35266, two at TR 02277 35234. Generally perched on decumbent

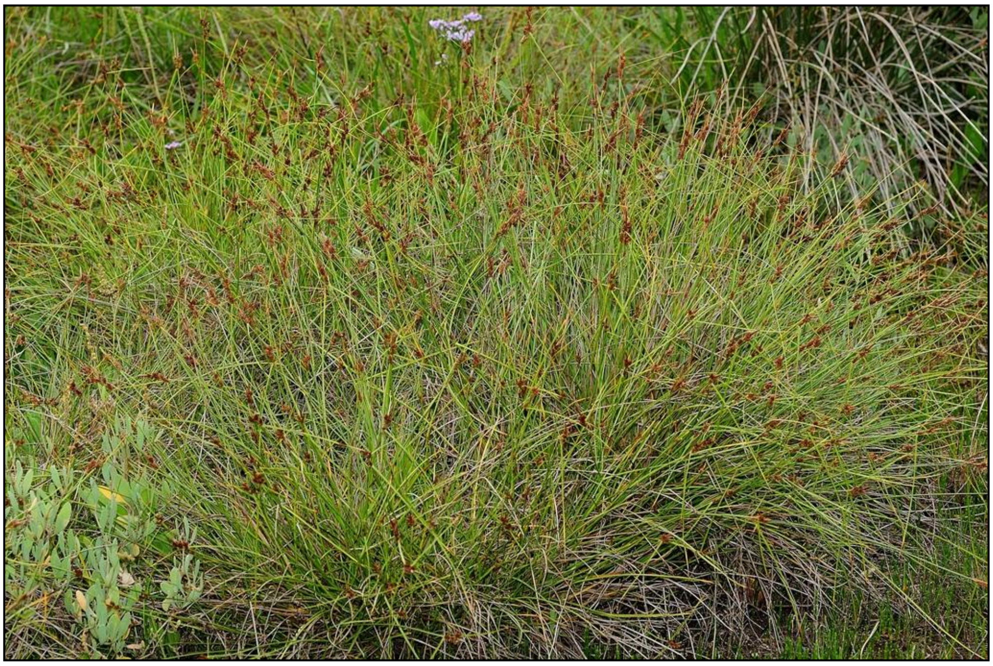
					Salix branches or trunks sunk into deep mud, although the last two tussocks comprised one on a piece of wood used to demarcate the pond from path and other on the edge of the pond bank. Not much accompanying flora, but included *Lycopus europaeus* and *Carex remot*a. *Hottonia palustris* present in a couple of the ponds. (3) TR 02273 35234 to TR 02273 35267 to TR 02328 35243: over 20 widespread tussocks across a series of interconnected swampy ponds in Norland Wood. (4) At least five clumps in Norland Wood at TR 022 353 where there is a series of wooded ponds.

Carex extensa Gooden. (Long-bracted Sedge)

vc 15

Rarity / scarcity status

Whilst not uncommon along the coasts of the British Isles, other than in the east, and so raising no particular conservation concerns, the Long-bracted Sedge is in Kent confined to the estuarial coast north of Sandwich, and is **rare**. It is a Kent axiophyte, regarded as an indicator of good habitat.



Shell Ness. Photo by Lliam Rooney, 20 July 2011

Account

The first published record for *Carex extensa* in Kent is in 1862[107], between Reculver and St. Nicholas (at Wade). Other early records are also located near Reculver, and a specimen in the herbarium of John Stuart Mill was apparently annotated as being from the mouth of the Reculver river. Presumably this was the Wantsum River, and it is revealing that the only other discovery in Kent (where the plant still grows) is at the mouth of the Great Stour near Sandwich. The Great Stour used to discharge into the Wantsum Channel (when the Isle of Thanet was still an island) and so there was access from the Great Stour to the sea both at Reculver and Sandwich. The Channel gradually silted up, particularly during the 12th and 13th centuries: the last boat to use the Channel did so in 1672 and the closure of the northern sea wall was undertaken in 1808[108]. The likelihood is that *Carex extensa* was associated with the silty estuarine flats of the Wantsum Channel, possibly throughout from the north coast to the east, but at some point after 1899 its distribution became reduced to one end, near Sandwich.

Here it was recorded in Philp (1982) and (2010), in the latter survey found in two tetrads, an addition of one to the earlier survey, but this alone does not necessarily correspond to any population trend. Our 2010-22 records amount to three tetrads (four monads) and this further increase in records may be indicative of spread. There is potential for expansion of the sedge in this locality if able to extend with the mobile sandbanks and saltmarsh at the mouth of the Stour which are gradually moving northwards. A northward leap has been made in its colonisation of the gaps in the concrete apron of the former Ramsgate hoverport (ceased operation from 1982; plants found 2018).

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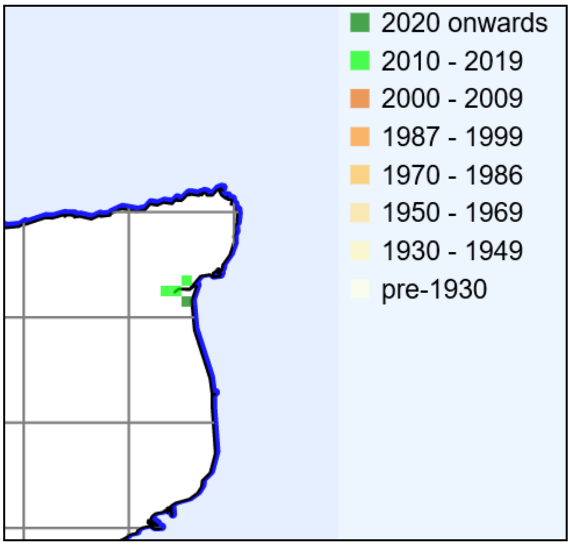
[107] Kentish Botany. A chapter on the Botany of Thanet. *Phytologist,* new series, vi: 50-57.

[108] *An Historical Atlas of Kent* (2004), eds T. Lawson & D. Killingray. Phillimore, Chichester.

***Carex extensa* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Carex extensa is, as its English name suggests, characterised by the extended bracts subtending the spikelets which well exceed the whole inflorescence. At Shell Ness, it is abundant on the saline estuarine flats, both on bare sand and mud and also coastal grassland, the damp edges of dune-slacks, and may accompany saltmarsh species such as *Atriplex portulacoides* (Sea-purslane) and *Salicornia* spp. (Glassworts).

Shell Ness. Photos by Lliam Rooney, 20 July 2011

Site	Grid reference	Site status	Last record date	Recorder	Comments
Stour Estuary	TR3360		2 March 1983	ACH	TR 337 608.
Stonelees	TR3362	NNR	2 July 2013	KBRG meeting	13 plants in small saltmarsh by Line of Pillars and KWT Stonelees Reserve at TR 33949 62695.
South of Shell Ness	TR3461	SSSI	2 March 1983	ACH	TR 343 614.
Shell Ness, Sandwich	TR3462	SSSI, NNR	20 July 2011	SB & LR	Plants abundant and extensive, forming tussocks on bare estuarine sand and mud, TR 34840 62440. Plants extensive in saltmarsh at TR 34885 62535. Abundant in coastal grassland with *Oenanthe lachenalii* at TR 34812 62399.
Princes Golf Links, Sandwich	TR3560	SSSI	4 August 1996	FR	Locally abundant
South of Shell Ness	TR3561	SSSI	(1) 28 June 2020 (2) 1 August 2015 (3) 20 July 2011	(1) SB & SL (2) SL & LR (3) SB & LR	(1) Sandwich Bay, north east of Sandwich, c. TR 350 618. Damp edges to dune slacks, north of golf course. Scattered plants. (2) Sandwich Bay, south of Shellness, in a damp hollow, TR 35095 61816. (3) TR 35116 61793, a few plants in a damp sandy hollow. Plants increasing in abundance on damp sand and mud from TR 35087 61836 to TR 35052 61916 alongside saltwater pool.
Pegwell Bay	TR3563		17 July 2018	SB	Well established in gaps on the concrete apron of the old hoverport TR 3505 6397.

Carex lepidocarpa Tausch (*Carex viridula* subsp. *brachyrrhyncha*) (Long-stalked Yellow-sedge)

vc 15; probably long gone from vc 16

Rarity / scarcity status

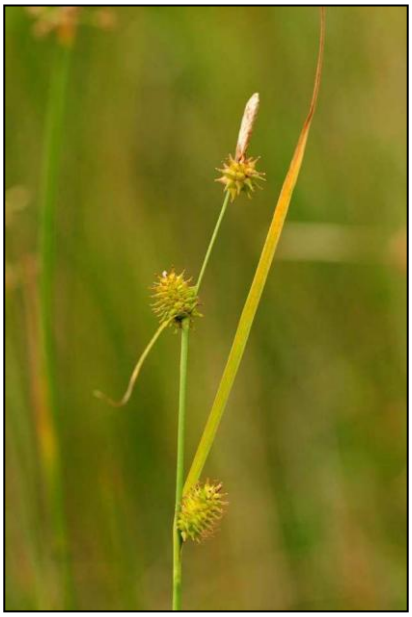
Carex lepidocarpa is a frequent plant of northern England, Scotland and Ireland, where wet areas are flushed with base-rich waters, and the risk to this species in both England and in Great Britain as a whole is regarded as of Least Concern. It is less frequent in southern England; and in Kent, Philp (2010) gives only two tetrad records, so it is treated as **rare**.

Account

The group of sedges which has been called the *Carex flava* group, and which currently comprises *C. flava* (Large Yellow-sedge), *C. lepidocarpa*, *C. demissa* (Common Yellow-sedge) and *C. oederi* (Small-fruited Yellow-sedge), has been subject to much taxonomic uncertainty, particularly because of the variability of the different taxa and the overlap or intermediacy of many of their characters. What is recognized as a species, subspecies or variety has changed from time to time, which also presents difficulty for tracing any trends in the occurrence of *C. lepidocarpa* in Kent. Hanbury & Marshall (1899) did not recognize it as a county species, although this may also be an indicator of its rarity, but there is a specimen collected by H. Lamb in 1900, by a calcareous spring from the ragstone between Barming church and the railway[109].

Ham Fen, habitat. Photo by Lliam Rooney, 1 August 2012

Except for this record, it appears to be an East Kent plant, and a number of sightings were made by Francis Rose in the 1940s or 1950s, including, not only those given under ‘Comments’ in the following table, but also calcareous fen-meadows with peaty ditches at Wingham Fen and Worth Minnis. A habitat theme runs through these Kent listings, of wet base-rich ground (often below chalk hills) in grassland which may be kept open by grazing or water fluctuation. The peaty base of a rich calcareous fen habitat for this species is mentioned in a Finnish study as varying from 25cm to over 1m; the sedge is regarded there as sensitive to hydrological change.[110]



Ham Fen. Photo by Lliam Rooney, 1 August 2012

An unexpected new site for this sedge was discovered in 2023, at Peter’s Pit on the East Kent side of the Medway Valley. A small patch was found growing at the margin of a lake in an old chalk quarry, with seasonally variable water levels. This is remote from other occurrences, including historic ones. The likelihood is that it was brought in by birds or possibly on tools in the course of management by Kent Wildlife Trust, who also manage Ham Fen reserve where the sedge is present.

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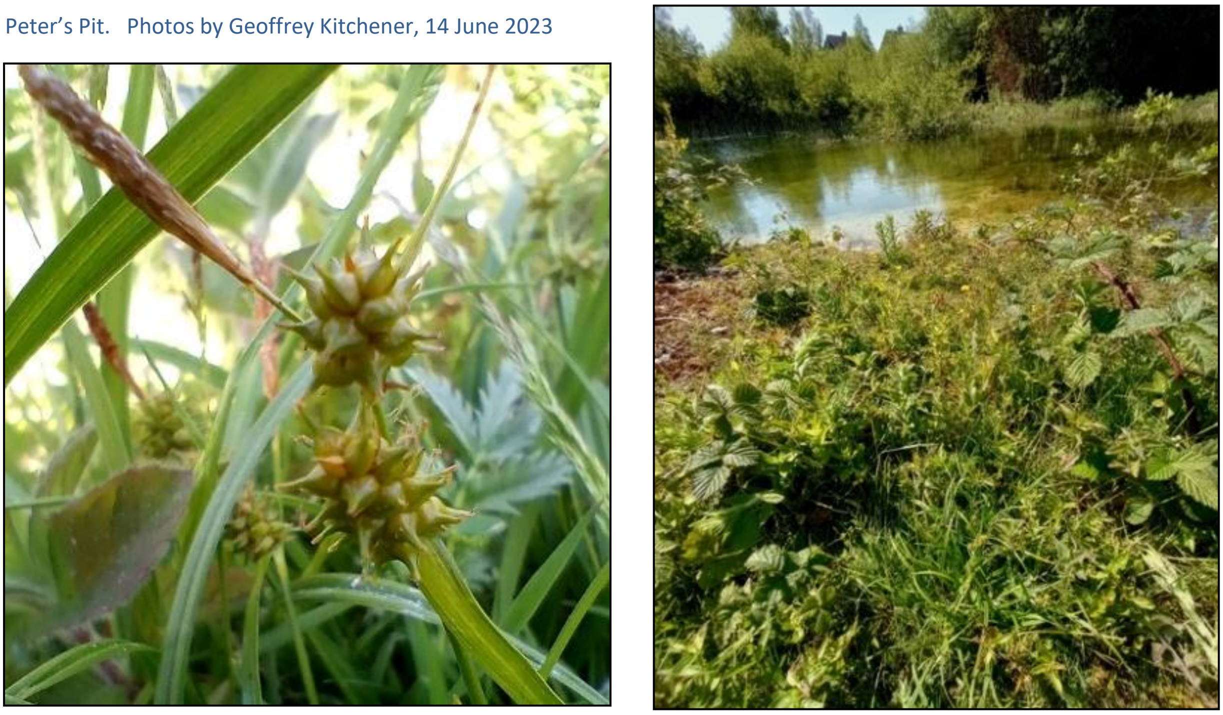
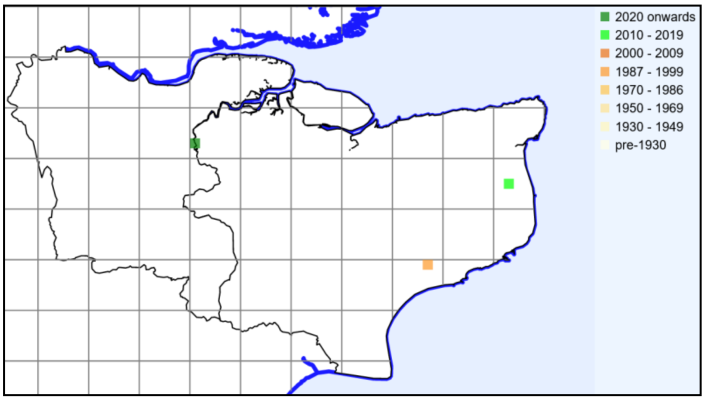
[109] Habitat since choked by *Equisetum telmateia*, *Galium aparine* and *Urtica dioica*, and so unsuitable (SL, 2016).

[110] Pykälä, J. (1994). The ecology and distribution of *Carex lepidocarpa* subsp. *lepidocarpa* in Finland. *Annales Botanici Fennici* 31: 261-274.

Peter's Pit.   Photos by Geoffrey Kitchener, 14 June 2023



Carex lepidocarpa has yellowish-green leaves, as with the Yellow-sedges generally, and the spikelets are subtended by long bracts. Particularly characteristic is the male terminal spikelet whose pendunce is set at an angle to the stem below.



***Carex lepidocarpa* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Ham Fen. Photo by Lliam Rooney, 1 August 2012

Site	Grid reference	Site status	Last record date	Recorder	Comments
Peter's Pit, Burham	TQ7163	KWT reserve, SSSI	14 June 2023	GK	TQ 71877 63108, small patch on chalk, east margin of eastern lake by small promontory at Peter's Pit. Water levels evidently very variable seasonally. Associated spp: *Lythrum salicaria, Mentha aquatica, Potentilla anserina, Pulicaria dysenterica, Rubus* [*caesius*?], *Salix cinerea* (seedling). Area is one of cut-back scrub (by KWT). Location was former working pit; assumed that sedge can only have been brought in as introduction by birds or KWT (possibly on tools, but this sedge is

					very rare elsewhere in Kent anyway).
Brook	TR04R		(1) 1 June 1999 (2) After 1970, before 1981	(1) BB & FR (2) Philp (1982)	(1) Location given as Cuckolds Coombe fen meadow, TR04. (2) TR04R. Also recorded by FR in the 1940s and 1950s at Cuckoldcombe Farm, by an alkaline brook running over the gault from the chalk downs. He also referred to it in a calcareous fen-meadow below chalk springs (although it is unclear how his description of it being SE of Brook and ½ mile NE of Troy Town is self-consistent). [FR stated that it was gone by 1978; not seen, SB & AG, 2014.]
Etchinghill	TR13U, includes TR1739	SSSI, at least in part	(1) 1991-99 (2) 23 June 1986	(1) EGP (2)	(1) TR13U, probably TR1739. (2) The Lince, TR1739, locally abundant. Also recorded by FR in the 1950s from the Lince, east of Etchinghill, in grazed calcareous spring-fed fens.
Ham Fen	TR35H, includes TR3354, TR3355	KWT managed reserve, SSSI	(1) 17 June 2018 (2) 19 July 2017 (3) 13 July 2013 (4) 1 August 2012 (5) 5 August 2001 (6) 29 June 2002 (7) 12 June 1991 (8) 2 March 1983	(1) SL (2) SB & SL (3) KFC meeting (4) SB & LR (5) BW (6) EGP (7) JP ((8) ACH	(1) Hacklinge, west side of A258 (Ham Fen KWT), flooded ditch, cattle poached edge along both sides (Unit 53: Ham Fen Fields), TR 33846 54488 to TR 3376 5442. Common. (2) Ham Fen. Plants seen from TR 33107 55238 southwards in base-rich wet peaty mire. (3) A small area at one end of a grazed mire centred around TR 33426 54908. *Lysimachia tenella* also present. (4) Abundant in wet peaty area amidst low reed growth, TR3337 5489. (5) TR3354. (6) TR35H (7) TR3354. (8) TR 339 543. Also recorded by FR in the 1950s near a dyke in a grazed fen-meadow.

Carex nigra (L.) Reichard (Common Sedge)

vc 15 and 16

Rarity / scarcity status

Carex nigra is very widespread sedge in the British Isles in a range of habitats, and there are no Great British (or English) issues of risk for conservation purposes. Kent is virtually the only area in the British Isles for which this statement does not hold good. It is far from common in the county, there is evidence of decline, and although it is more widespread than had been supposed, the rate of decline has been such that it is being maintained as a register species. It is also a Kent axiophyte and so an indicator of good habitat.

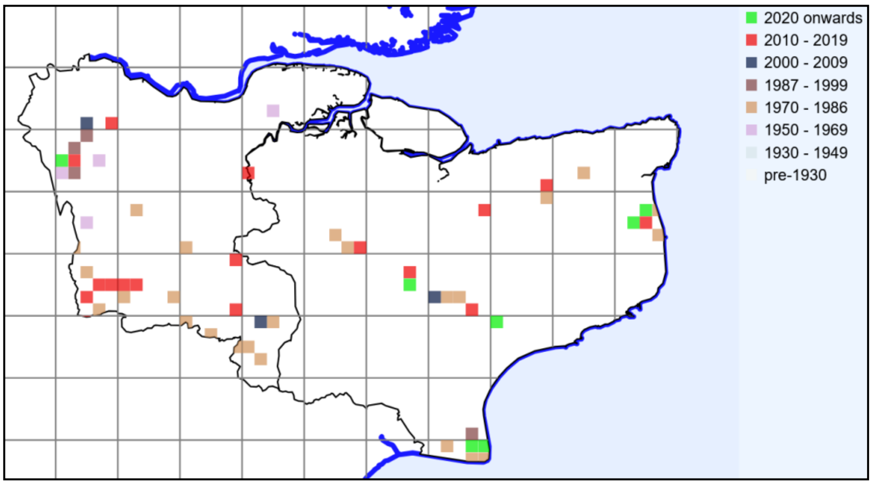
Account

The first record for Kent was made by Thomas Forster in his *Flora Tonbrigensis* (1816), when he describes it as "On bogs and in wet groves, not uncommon". Hanbury & Marshall (1899) considered the species to be frequent, and found in every district except their district 6 (the North Downs from Wye to Rochester), adding that no doubt it also occurred there. Given that the plant avoids both extremely basic and acidic habitats (Francis Rose treated it as usually on peat, and where the water was weakly acid to calcareous, pH5.0-7.5), the potential for favourable habitat is fairly wide, and it is clear that Common Sedge was formerly not uncommon throughout Kent. Even by the time of the survey published as Philp (1982), it could be found in 34 tetrads in the administrative county, generally in the Weald, along the Folkestone and Hythe Beds traversing East Kent, at Dungeness and a few in north east Kent (the Stour valley and Sandwich area). In the period 1991-2005, however, Philp (2010) could only trace it in nine tetrads, despite search in many former localities, so there is some evidence of a serious decline.

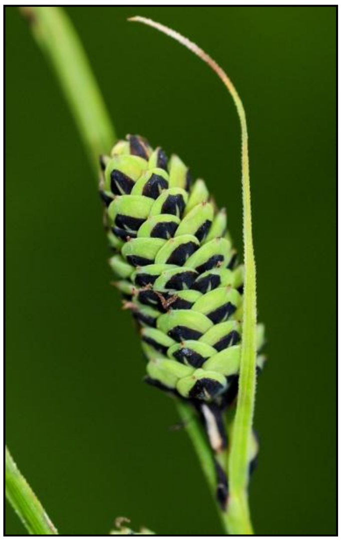
Hothfield. Photo by Lliam Rooney, 19 April 2011

Records for 2010-24 amount to 24 tetrads (28 monads), so that the decline from 1971-80, although ostensibly 29%, is actually 38% if one excludes Greater London vc16 records as this area was not covered by the 1971-80 survey and carries suitable terrain. The distribution map below shows these recent records, but also makes it clear how much more frequently it was encountered earlier, especially in the 1970s.

***Carex nigra* Kent records to 2024 mapped at tetrad level, from BSBI database**



The Kent habitats in which it has been found are varied and include swampy alluvial meadows, valley bog, peaty pond borders, damp heathland on Folkestone Sand, fen-meadow on calcareous peat, calcareous dune slacks.



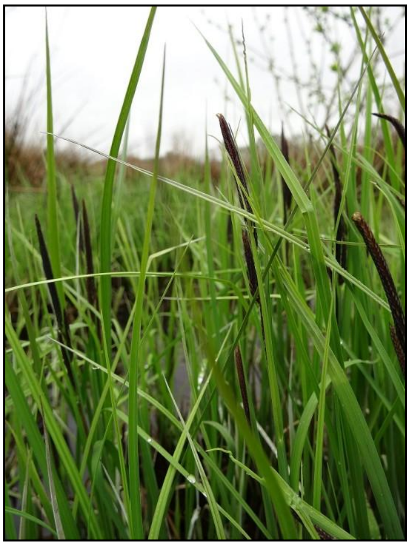
Carex nigra is characterised by the black, generally blunt female glumes with green midrib and while it normally forms clonal patches, it can also be tussock-forming (possibly in fluctuating water conditions when the rate of both growth and decomposition of its litter are slow). The florets have two stigmas, which help distinguish from *Carex flacca* (Glaucous Sedge) and *Carex panicea* (Carnation Sedge), both with three stigmas and which may share some of the same habitats.

Gibbin's Brook. Photo by Lliam Rooney, 1 July 2013

Holborough marshes, habitat. Photo by Geoffrey Kitchener, 27 June 2011

Not only is Common Sedge relatively uncommon in Kent, it also transpires (as a result of investigations by Stephen Lemon in 2015 and of the determination of material which he forwarded to Mike Porter, BSBI referee) that much of what was previously thought to be *Carex nigra*, at least in the Eden catchment, is actually its hybrid with *C. acuta* (Slender Tufted-sedge), sometimes called *C.* x *elytroides*. The hybrid is generally a larger plant than *C. nigra*, with broader leaves; and it usually has a lower bract more or less equalling the inflorescence, whereas that of *C. acuta* well exceeds it. Its intermediacy is shown by abundant stomata on both sides of the leaf surface – *C. acuta* only has stomata on the lower side and in *C. nigra* they are mostly restricted to the upper surface. So far, the hybrid has been found in five sites, mostly in what appear to be large self-sustaining populations in the Eden floodplain, extending into Surrey (vc17), but in only one of these (at Moorden) has it been found with both parents growing also in the vicinity. There is also an isolated population at Dungeness. Records of the hybrid are included in the following table (in blue).

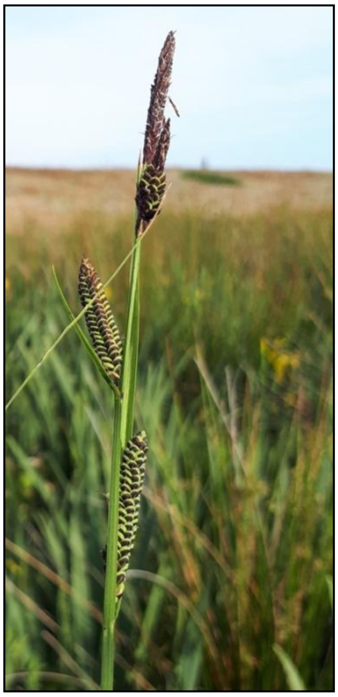
Moorden, Chiddingstone, habitat of *C.* x *elytroides*. Photo by Stephen Lemon, June 2014



Carex x *elytroides,* River Eden valley. Photo by Stephen Lemon, 8 June 2015

There is also a further *C. nigra* hybrid present in Kent, the cross with *Carex elata* (Tufted-sedge), viz. *Carex* x *turfosa* (given in maroon in the accompanying table). So far this has only been found (2020) in one location, a small natural pit on shingle at Dungeness, with *C. nigra* present, but not *C. elata*. The hybrid is more robust than *C. nigra*, has very variable bracts and bears stomata more or less equally on both sides of the leaves– *C. elata* only has stomata on the lower side and in *C. nigra* they are mostly restricted to the upper surface. There are no other plants known nearer than Cambridgeshire.

Carex x *turfosa*, Dungeness. Photos by Stephen Lemon, 14 June 2020



The propensity of *C. nigra* to form hybrids may have resulted in introgression giving rise to its morphological variability; and Grime *et al.* (1988)[111] suggest that this in turn may have given rise to its wide habitat range.

Carex nigra entries are in **black**; *Carex* x *elytroides* entries are in **blue**; *Carex* x *turfosa* are in **maroon**.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Ravensbourne Meadows, Keston metropolitan vc16)	TQ4164	SSSI	(1) 16 July 2022 (2) 30 April 2012 (3) 17 May 2005 (4) 12 May 2001 (5) 1995	(1) LNHS meeting (2) and (3) JP (4) JP and KFC meeting (5) JP	(1) Keston Bog north of Fishponds Road. (2) In wet meadow. (3) TQ 417 645. (4) Much seen, at damp neutral meadow. (5) At least 12 clumps in very wet central meadow.
Holwood Park, Keston (metropolitan vc16)	TQ4263		June 1987	JP	TQ 422 637.
North of Gilridge, Edenbridge	TQ4543		(1) 7 May 2016 (2) 14 June 2015	(1) & (2) SL	(1) Cowden Pound Pasture TQ 459 432, flowering in marshy area below slope. (2) TQ 45975 43241 / TQ 45971 43238, widespread along damp edge of valley bottom but mostly in leaf with only a couple of plants fruiting, at Cowden Pound Pastures
St. Paul's Cray Common (metropolitan vc16)	TQ46P		1987	JP	
Cowden	TQ4439		2 May 2016	SL	Wet field edge below road, north of Kent Water and between Scarletts and Furnaces ponds

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[111] Grime, J.P., Hodgson, J.G. & Hunt, R. (1988). *Comparative Plant Ecology*, Unwin Hyman, London.

					(probable site of C.E. Salmon's 1891 record for *Bistorta officinalis*), TQ 4470 3997, a few scattered plants in flower.
Between Edenbridge an d Hever	TQ4645		(1) 22 August 2020 (2) 7 June 2015	(1) & (2) SL	(1) *C.* x *elytroides* at River Eden floodplain opposite Swansnest Island, north-west of Hever, TQ 4696 4557, TQ 4693 4558, TQ 4691 4560. Unmanaged marsh developing along the northern floodplain of the river. Three separate sprawling patches in vicinity of plants found in 2015, patches ranging from large to tiny, with the larger two just south of developing *Salix* scrub. Leaves with stomata on both sides, long wispy leaves resembling Carex acuta. (2) *C.* x *elytroides* at TQ 46923 45592, in a marsh on floodplain north of River Eden (excavated since 2009), close to Swans Nest Island, with abundant stomata both sides of leaf (det. MP). At least ten large separated patches, first found by SL on 26 April 2015. One parent (*C. acuta*) was growing within a couple of hundred metres.
Hever	TQ4744		25 May 2015		TQ4 7102 44565 / TQ4 7093 44579, loose patches across at least ten metres, with few flowers present, on flushed *Juncus* slope in area of pasture field.
Chislehurst Common (metropolitan vc16)	TQ47K		2008	JH	Locally frequent in overflow pond and swampy ground nearby.
Joyden's Wood	TQ4970		4 June 2015	RMB	Under garden fence across footpath from Joyden's Wood at TQ 4997 7097, noted by recorder as an untypical plant in an untypical habitat, but specimen is closely matched by others.
North east of Chiddingstone Castle	TQ4945		(1) 2 June 2015 (2) 3 May 2014	(1) & (2) SL	Initially recorded in 2014 as *C. nigra*, but since re-determined (from June 2015 material) as *C.* x *elytroides.* TQ 49229 45812 and TQ 49216 45753, patches spread over damp field corner with dense patches near to pond, *Oenanthe silaifolia* close by. Other species noted in general vicinity: *C. acuta*, *Ranunculus flammula* and *Oenanthe fistulosa* Damp north corner of large field, west of Mill Farm, within floodplain of River Eden. Abundant stomata on both sides of leaves.
South west of Penshurst	TQ5143		17 May 1983	JP	TQ 515 432, pasture near River Eden.
Chiddingstone, Eden valley	TQ5145		(1) 8 June 2019 (2) 12 June 2016 (3) 7 June 2015 (4) 3 May 2014 (5) 2 April 2011 (6) 10 June 2010	(1), (2), (3), (4) &(5) SL (6) GK	Plants at this river floodplain site were Initially recorded as *C. nigra* (entries (4) to (6) below). However, a further gathering (entry (3) below) has been determined as *C.* x *elytroides*, and this is now taken to be the identity of the previous records. (1) Moorden, Chiddingstone Causeway, long narrow field along north side of stream, TQ 519 459. In peaty area. (2)(a) Moorden Meadow, area of

					flat boggy ground under Alder trees, TQ 51940 45864. Plants here form a few tussocks (var. *cespitosa*), although tussocks heavily colonised by other plants. (b) area of open damp grassland at far end of north facing slope down to stream, TQ 51966 45888. Small number of non-flowering plants. (c) flat valley bottom beside public footpath, north side of stream, dominated by Juncus, TQ 519644 5916. Non-flowering plants spread over area of several metres, fine leaved with stomata on upper surface only. (2) *C.* x *elytroides* (det. MP) at TQ 516 459 to TQ 517 458, with flowering plants spread over field side of flooded area, more abundant at western end. West of Moorden within floodplain of River Eden. Abundant stomata on both sides of leaves. (3) Location details as (1) above. (4) Two isolated plants in hedge in vicinity of *Carex vulpina* (TQ 51218 45819). Also near TQ 51681 45940, dominating a 20m x 10m area. (5) Well spread in wet corner of valley pasture from TQ 51717 45882 to TQ 51655 45935, at least 50 plants in flower (following find by SL on 5 June 2010).
Moorden	TQ5245		(1) 12 June 2016 (2) 3 May 2015 (3) 17 March 1999 (4) 20 May 1984	(1) SL (2) SL (3) JP & JH (4) JP	(1) Moorden Meadow LWS (SE21), flushed ground on north facing slope, TQ 52080 45968. Large thin spread (probable) clonal patch within area of c. 3 x 4m. Stomata both sides of leaf, basal leaves wide and female glumes both pointed and with hyaline edge. Closer to *C. nigra* in size and bract size. Slightly smaller stature than the hybrid population discovered last year nearer the river. Good *C. nigra* populations close by. (2) TQ 52136 45997, noted in leaf (stomata above only, so not hybrid) on flushes down hillside above stream, with very few in flower: (3) TQ 521 459.
Rusthall Common	TQ5639		7 June 2009	BW	
Old Swan Farm, Lamberhurst	TQ6438		15 June 1999	JP & GB	TQ 649 388.
Hale Street	TQ6849		17 June 1999	JP & AC	TQ 684 493.
West of Horsmonden	TQ6940		13 June 2015		TQ 69279 40934 (two small plants, one in flower) and TQ 69285 40954: rough acid grassland above southern edge of Furnace Pond.
Laddingford	TQ6948		15 May 2014	GK	TQ 6991 4846, small quantity at edge of pond on south east side of Emmet Hill Lane.
Holborough	TQ76B	KWT reserve, SSSI	(1) 26 May 2014 (2) 25 June 2013 (3) 19 July 1996	(1) GK & SL (2) GK & LR (3) PH	(1) TQ 7066 6245, *C. panicea* growing in close vicinity. (2) A loosely tufted patch, 3 x 2m, in marshes at TQ70750 62461 with associated species *Juncus articulatus, Ranunculus flammula, Potentilla anserina, Mentha aquatica, Carex otrubae, C. distans,*

					Iris pseudacorus, Equisetum palustre, Juncus inflexus.
North of Goudhurst	TQ73J		15 May 2003	EGP & DG	TQ73J.
North west of Goudhurst	TQ7438		12 August 1983	JP	TQ 740 388, Knights Hole.
Sandway	TQ8950		24 May 2015	SL & LR	TQ 89146 50755: thin spread of plants, one in flower near sheep grazed edge of circular pond.
Hothfield	TQ94S, includes TR9645	KWT reserve, SSSI	(1) 23 June 2022 (2) 25 May 2010 (3) 26 May 2008 (4) 1991-99	(1) AL (2) GK (3) DM (4) EGP (Philp, 2010)	(1) TQ 968 456. (2) Plentiful in main bog of Hothfield Common, TQ9645. (3) TQ 9686 4572. (4) TQ94S. There is a history of occurrences here, including FR 1943-87.
Hothfield	TQ94T, includes TQ9646	KWT reserve, SSSI	(1) 25 May 2010 (2) 1991-99	(1) GK (2) EGP (Philp, 2010)	(1) In northern bog of Hothfield Common, TQ9646. (2) TQ94T.
Boulderwall, Dungeness	TR01U, includes TR0618, TR0718	Includes RSPB reserve, NNR, SSSI	(1) 30 April 2022 (2) 14 June 2020 (3) 2 May 2019 (4)13 May 2017 (5) 10 July 2016 (6) 13 May 2012 (7) 15 June 2010 (8) 26 June 1996	(1) SL (2) SL (3) AWi (4) SL (5) KBRG meeting (6) BB (7) GK (8) EGP	(1) Dungeness SSSI (Unit 25), Open Pit 1, TR 0722 1858, TR 0724 1856. *Salix* swamp along northern eastern side. Flowering on damp floor of pit under shade of *Salix*. Producing both spreading patches and tussocks. (2) Denge Beach, between Open Pit 1 and power station approach road, TR 0780 1850 to TR 0776 1856. A small natural pit formed in the shingle, with a wet floor. At northern end, including a tall tussock under *Salix cinerea* bush. (3) TR0618. (4) Dungeness RSPB Reserve, west side of Open Pit 6 (*Cladium* Pit), TR065183. Some plants with long inflorescences, less rounded female glumes and bracts long exceeding inflorescence but with more typical stomtata. Specimens sent to Mike Porter, BSBI referee, who agreed still *C. nigra*. (5) *Salix* carr in north eastern corner of Open Pit 1, TR 0724 1857. Thin carpet of plants under Salix canopy, not found nearby in open thick/scrubby marsh at edge of pit. Within a short distance of where recorded on 15 June 2010. (6) TR0618, scattered individuals in *Cladium* Pit. (7) TR0619, by lake n w of footpath through ARC site, extent of population not noted. Also TR0718, in damp tussocky area around pit, covering about 5m x 1m (TR 0724 1859). (8) TR01U.
Dungeness	TR0620	NNR, SSSI	19 December 2021, revisited 22 April 2022	SL	*C.* x *elytroides* (det. MP) TR 0647 2055, in a natural pit in the shingle, north-west of the Waterworks. Originally supposed to be *Carex elata* based on the tussocky habit and stomata on the base of what were then very small young leaves. However, the mature leaves have stomata abundantly on both sides, the tussocks are smaller than *C. elata* tussocks, the bracts are as long as or exceed the inflorescence and laddering to the sheaths was not found. It has pointed female

					glumes and is strongly tussock forming, which may be derivative from hybridisation with the tussock form of *C. nigra*. The pit where it grows in small, scrubby and unmanaged, without other *C. nigra* group sedges present or in the immediate vicinity.
Dungeness – Denge Beach	TR0818	NNR, SSSI	14 June 2020	SL	Denge Beach, between the Old Coastguard Cottages and the Open Pits, TR 0806 1811 to TR 0807 1807. A small natural pit formed in the shingle with a damp floor, approximately 120 metres south-west of the power station approach road. Forms both spreading and producing low tussocks, growing with its *Carex elata* hybrid = *Carex x turfosa*. *Carex* x *turfosa*, growing as above with the C. nigra parent and more abundant than it. *Carex elata* not present in the pit but is in Open Pit 4, approximately 0.8 km to the west. Compared with *C. nigra* the hybrid is more robust, stomata more or less equally on top and bottom of the leaves, bracts variable (shorter than to greatly exceeding inflorescence), utricles with a short neck, female glumes smaller than utricles. Identification confirmed by MP, BSBI referee, from photographs.
Lydd airport	TR02Q		1991-99	EGP (Philp, 2010)	
Ashford	TR04B		25 April 2002	EGP & DG	Damp area near the Great Stour.
Ashford, Willesborough Lees	TR0342		20 May 1977	EGP & FR	
Hatch Park	TR04Q, includes TR0640	SSSI	(1) 21 July 2016 (2) 1991-99	(1) KBRG meeting (2) EGP (Philp, 2010)	(1) TR 0647 4067, scattered through mire at eastern end of Boating Pond in park. (2) TR04Q. Also seen here historic record) by FR and ES, in a marsh bordering the main lake.
Gibbin's Brook	TR13E, includes TR1138	CROW access land, SSSI	(1) 23 June 2023 (2) 6 June 2020 (3) 30 June 2013 (4) 1991-99	(1) KBRG meeting (2) SL (3) KBRG meeting (4) EGP (Philp, 2010)	(1) Gibbin's Brook SSSI, southern mire, TR 1158 3854. (2) Gibbin's Brook, north-east of Sellindge, TR 1158 3852. Shrinking areas of open base rich fen formed over peat in area south of pond, now ungrazed, going rank and scrubbing over. (3) Found at TR 11607 38679 in wet ground of northern bog, apparently far-creeping but mostly sterile shoots. Also in southern bog, with *C. panicea* at TR 11594 38591. (4) TR13E. Also recorded here by FR back to 1945.
South east of Fordwich	TR1858		12 May 2005	JP	TR 186 587.
Trenleypark Wood complex	TR1958		12 May 2005	JP	TR 191 585 (may be a generic site reference).
Westbere	TR1960		2 May 2016	AL & TR	
East Blean	TR1864		19 March 1972	MN	TR 1883 6443, East Blean Wood.
Stodmarsh NNR, Hersden	TR2161	NNR, SSSI	June 1991	CD	TR 2117 6166.
Ham	TR3354	KWT managed	(1) 28 July 2024 (2) 17 June 2018	(1) AL & TS (2) SL	(1) TR 3361 5481. Semi-restored field. Ham Fen.

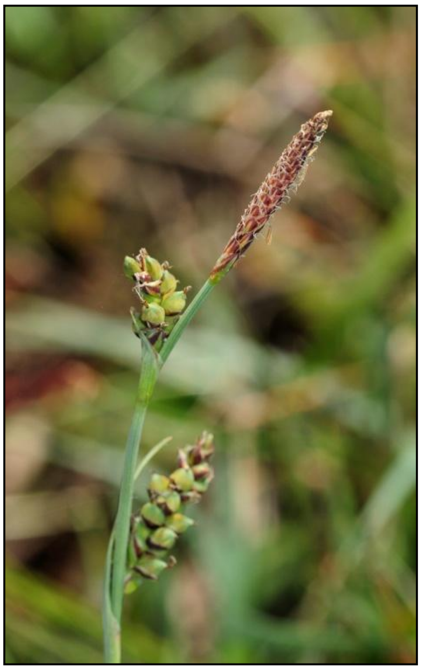
		reserve, SSSI	(3) 13 July 2013	(3) KFC meeting	(2) (a) Hacklinge, west side of A258, cattle grazed pasture and ditches (Unit 56), northern end, TR 3386 5459. Common. (b) Ham Fen reserve, small wet cattle grazed pasture with very tall herb layer (Unit 53: Ham Fen Fields), bounded by North Stream to the east and South Stream to the north, TR 33799 54548. Abundant, very tall form. Specimen confirmed by MP. (3) A cluster of plants at TR 33598 54819 in meadow at Ham Fen.
Ham	TR3355	KWT managed reserve, SSSI	19 July 2017	SB & SL	Ham Fen. Scattered plants seen around TR 3315 5517 on wet calcareous peat.
Ham/Hacklinge	TR3454	SSSI	(1) 17 June 2018 (2) 31 August 2016 (3) 24 July 1991	(1) SL (2) SL (3) FR	(1) Hacklinge, west side of A258, cattle grazed pasture and ditches (Unit 56), area north of the North Stream, TR 340 543. Large patch in small ditch. (2) Cattle-grazed marshy sedge-rich fen pasture in Ham valley, on west side of A258 south of Hacklinge Farm. Area south of the dividing dyke, TR 3406 5423; in damp closely grazed sward with *Hydrocotyle vulgaris*.
Sandwich Bay	TR3557	SSSI	23 May 2022	KBRG meeting	Dune slack on northern side of public footpath in Royal St. George's Golf Course, TR 3578 5793. In old slack where periodically scraped back to sand. A few spreading stiffly erect, fruiting plants, with clustered female spikes, taller than the *Carex flacca* sward. Female glumes, pointed, black and some aristate with thin green midrib. Purple spotting on a few immature utricles. Leaves very thin and inrolled with stomata both sides, lower bracts not exceeding inflorescence. Considered by SL to be *Carex trinervis* x *C. nigra* = *Carex x timmiana*, but specimen re-determined by MP and RWa as a variant of C. nigra, based on bract length exceeding inflorescence and the acuminate rather than aristate glumes. The stomata on both leaf surfaces and inrolled leaves considered by MP part of the variation of *C. nigra* and seen by him on various *C. nigra* herbarium specimens.

Carex panicea L. (Carnation Sedge)

vc 15 and 16

Rarity / scarcity status

Carnation Sedge is common and widespread throughout the British Isles, except for south east England, where there has also been some decline since the 1950s. The risk of threat to this species is regarded as of Least Concern in England and in Great Britain as a whole. However, in Kent it is **scarce**. It is a Kent axiophyte, regarded as an indicator of good habitat.


Hothfield. Photo by Lliam Rooney, 19 May 2011

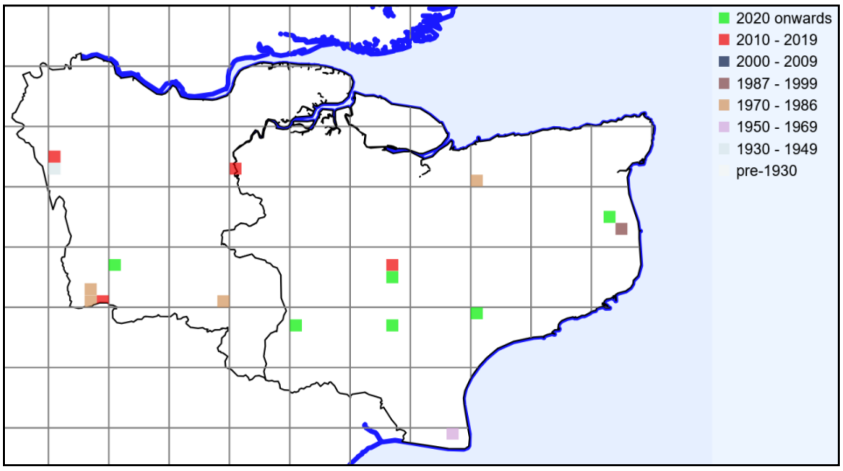
Account

The first mention of *Carex panicea* in Kent is of its presence as the Round-grained Bog-Cyperoid "On *Chislehurst* and other *Bogs*" in James Petiver's *Graminum, Muscorum, Fungorum, Submarinorum etc. Britannicorum Concordia* of 1716. Forster's view of its status in the Tonbridge area in 1816 was that it was very common in moist fields and pastures. Hanbury & Marshall (1899) assessed it as rather common in Kent, to be found in heaths, meadows and swamps.

Francis Rose in the 1940s, 1950s and 1960s found it widespread but only locally common; absent from dry chalk country. It was, he considered, a plant of fens, fen meadows, basic flushes, and the more flushed parts of valley bogs, usually in short vegetation and tolerant of grazing; commonest in the East Kent fens, rare in the Dungeness area, where confined to sites of calcareous flushing. He noted 20 sites for dated records in those decades, plus half as many again undated.

Cowden, habitat. Photo by Stephen Lemon, May 2016

***Carex panicea* Kent records to 2024 mapped at tetrad level, from BSBI database**



It has declined substantially since then, being reduced to nine tetrads in 1971-80 (Philp, 1982), and with only five recorded in Philp (2010) for 1991-2005. In the period 2010-24 it was recorded in ten tetrads (11 monads), so it is not necessarily the case that the decline is continuing. The accompanying distribution map shows some losses, but the earlier Francis Rose records are not represented, as the BSBI database does not cover them.

The sedge may be found in a variety of damp or wet habitats, and on substrates with varying base content, favouring areas with sloping flushes where water flows through. In Kent it has been recorded in wet alluvial meadows, calcareous fen-meadows on peat, flushed bog with some base enrichment, a boggy ditch on Tunbridge Wells Sand, and peaty fen over shingle. Given the variety of this range of habitats, it is unsurprising that records are widely scattered across the county. It is intolerant of shade, and is capable of forming large patches

Habitat, Alex Farm Pastures. Photo by Alfie Gay, 14 May 2022

Carnation Sedge is so named for its greyish stems and its leaves which are glaucous on both sides, whereas *Carex flacca* has leaves which are only glaucous above. When in fruit, its spikelets are distinctive for the relatively few, separated fruits, the utricles being inflated with their apex pointing outwards. The inflation gives prolonged buoyancy for seed dispersal in water[112], although in Kent it is seen growing on flushed ground rather than by streams or pools, so that unless flushing is boosted by stronger flow in winter, seed dispersal is likely to be over a limited area. In any event, it appears to be a poor colonist.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Keston Bog (metropolitan vc16)	TQ4164	Common owned by L.B. of Bromley	13 June 2007	JP	TQ 41715 64325, edge of bog just above bottom dam.
Cowden Pastures	TQ4741, TQ4841	SSSI	(1) 21 June 2015 (2) 12 June 1982	(1) SL (2) JP	(1) TQ 48043 41461, most plants in leaf, some seeding, top of flushed slope near trees with *Bolboschoenus maritimus* and *Carex flacca*. (2) TQ 479 415.
Bassett's Mill / Farm, near Cowden	TQ44V	SSSI	(1) 2 May 2016 (2) After 1990 and before 2006	(1) SL (2) EGP (Philp, 2010)	(1) Cowden Meadows, TQ 48063 41450, open area of flushed ground between encroaching Alder trees, scattered plants in flower. (2) Valley in either TQ4841 or TQ4941.
Chiddingstone Causeway	TQ5147		(1) (2) 4 June 2017	(1) KBRG / KFC meeting (2) SL	(1) Chiddingstone reserve. (2) Chiddingstone Old Clay Pits, TQ 51112 47104. Area of flushed ground in north western corner of a clay pit. Several patches fruiting over a couple of metres with associates *Carex flacca* and *Carex demissa*. Searched for here since 2007 but not found until now. Probably has grown more noticeable or perhaps resurrected from seed bank following the cutting back of shading tree growth

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[112] Grime, J.P., Hodgson, J.G. & Hunt, R. (1988). *Comparative Plant Ecology*, Unwin Hyman, London.

					since 2007 and a more consistent annual cut and rake of the sward since 2012, preventing a build-up of thatch and *Juncus* domination. Previously recorded by JP nearby in a different clay pit on 28 June 1994, c. TQ 5112 4700, but subsequent searches there have been unsuccessful.
Chiddingstone Causeway	TQ5249		13 August 1983	JP, KFC meeting	c. TQ 520 459, west of Moorden. North-facing slope above stream; peaty flushes on clay with springs from base of Tunbridge Wells Sand. [Not found, 2012.]
Old Swan Farm, Lamberhurst	TQ6438		(1) 9 July 2000 (2) 6 July 1999	(1) AC (2) JP & GB	(1) & (2) TQ 649 388.
Holborough	TQ7062	KWT reserve	(1) 26 May 2014 (2) 2 June 2013	(1) GK & SL (2) SL	(1) TQ 7066 6245, *C. nigra* growing in close vicinity. (2) One large patch, 4 x 4 metres, at TQ 70665 62327 with smaller patches close by at TQ 70670 62329 growing with *Carex flacca*. This was is the first field next to the railway track and close to the edge by the railway.
Bedgebury Park School	TQ7234		12 May 1999	JP	TQ 724 344.
Chittenden Wood, Hemsted Forest	TQ8136		(1) 15 August 2021 (2) 4 July 2001	(1) SL (2) EGP & BW	(1) Chittenden Wood, TQ 8186 3662. Southern boggy edge of open ride running east-west. In several spots along flushed ground at cross-roads of rides, with *Carex flacca*. (2) TQ8136, main ride of wood.
Hemsted Forest	TQ8236		20 May 1999	JP & JW	TQ 820 362
Shadoxhurst	TQ9636	SSSI	14 May 2022	AG	TQ 9669 3678, a single patch in the southern compartment of Alex Farm Pastures SSSI in a damp neutral meadow on Wealden Clay with *Viola canina* and *Carex nigra*. Confirmed by SL from photos.
Hothfield	TQ94S, includes TQ9645	KWT reserve, SSSI	(1) 23 June 2022 (2) 8 August 2015 (3) 15 June 2010 (4) 25 May 2010	(1) AL (2) BW (2) JA, LR (3) GK	(1) TQ 968 456. (2) TQ9645. (3) Main bog; a few plants at TQ 96827 45639. (4) TQ9645, present in main bog.
Hothfield	TQ94T, includes TQ9646	KWT reserve, SSSI	(1) 24 June 2019	(1) KBRG meeting	(1) TQ9646
Gibbin's Brook	TR13E, includes TR1138	CROW access land, SSSI	(1) 28 June 2023 (2) 6 June 2020 (3) 30 June 2013 (4) After 1990 and before 2006	(1) KBRG meeting (2) SL (3) KBRG meeting (4) EGP (Philp, 2010)	(1) Gibbin's Brook SSSI, southern mire TR1158 3854 (2) Gibbin's Brook, TR 1158 3852. Shrinking areas of open base-rich fen formed over peat in area south of pond, now ungrazed, going rank and scrubbing over. (3) In northern bog, at TR 11607 38679. In southern bog, at TR 11594 38591. Leaves noted more extensively, but little seen flowering/fruiting. (4) TQ13E.
Ham	TR3354	SSSI	(1) 17 June 2018 (2) 2003	(1) SL (2) CEC	(1) Hacklinge, west side of A258 (Ham Fen KWT), small wet cattle grazed pasture with very tall herb layer (Unit 53: Ham Fen Fields), bounded by North Stream to the east and South Stream to the north, TR 33799 54548. Abundant very tall form. Species not found in adjacent pasture to the east. (2) TR 33550 54770, Hacklinge Ditches Survey.
Ham	TR3355	KWT	(1) 13 June 2024	(1) AL & CA	(1) TR 330 552, Ham Fen

		managed reserve, SSSI	(2) 19 July 2017	(2) SB & SL	(2) Ham Fen. Populations seen around TR 3305 5529 and elsewhere within an area of wet calcareous peat.
Northbourne Fen	TR3453		After 1990 and before 2006	EGP (Philp, 2010)	
South east of Worth Minnis	TR3455	SSSI	2003	CEC	Ditch, TR 34579 55517, Hacklinge ditch survey.
Worth Minnis	TR3456	SSSI	2003	CEC	TR 34386 56260, ditch north of Great Wood, Hacklinge ditch survey.
North of Betteshanger (formetly Fowlmead) Country Park	TR3654	SSSI	2003	CEC	Ditches, TR 36748 54792, TR 36859 54673and TR 3690 654813, Hacklinge ditch survey.
East of Lydden Valley	TR3655	SSSI	2003	CEC	Ditches, TR 36277 55107 and TR 36523 55493, Hacklinge ditch survey.

Carex pulicaris L. (Flea Sedge)

vc 15; gone from vc 16

Rarity / scarcity status

Widespread in northern and western Britain and in Ireland, Flea Sedge is not regarded as being at risk over Great Britain as a whole, although it has declined in south and east England, with habitats lost through drainage and so is considered to be **Near Threatened** in England. In Kent, it is restricted to one site, and so is **rare**. It is a Kent axiophyte, regarded as an indicator of good habitat.

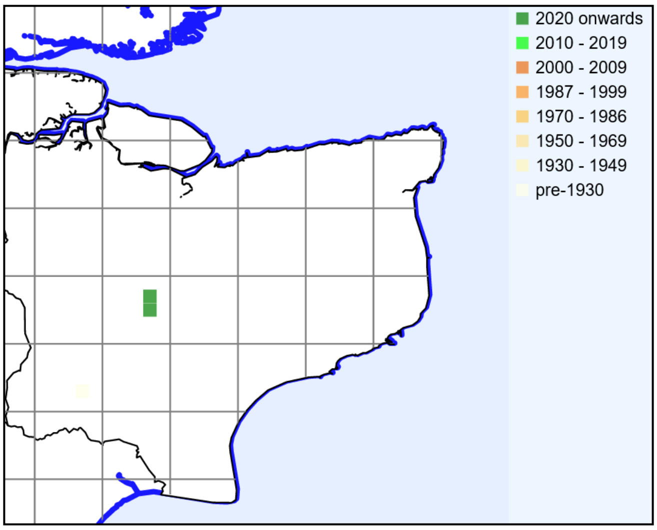
Account

Carex pulicaris was first recorded in Kent by Lewis Dillwyn as part of a list of rare plants in the Dover area submitted to the Linnean Society in 1801 (published 1802) and he cited it as in "Boggy ground about Ham Ponds". In Kent, it has never been in more than a handful of locations and was already regarded as rare at the time of Hanbury & Marshall (1899). Its current site at Hothfield had even then been known for some time, as material of that provenance was held in the herbarium of John Stuart Mill (1806-1873).

Hothfield. Photos by Lliam Rooney,
19 May 2011 (l.) and 24 July 2013 (r.)

In West Kent, it has not been seen for a very long time, assuming that identification of species and location was correct in the first place. Edward Jenner, in his *Flora of Tunbridge Wells* (1845) regarded it as common in bogs, etc., although these could have been East Sussex localities. Its last appearances at Hawkenbury Bog (TQ5937), where it was recorded in 1966 and 1969, are for an East Sussex site (sometimes incorrectly attributed to West Kent).

In East Kent it was, apart from Hothfield, most recently known at Gibbin's Brook (TR1138), where Francis Rose collected it in 1954 on damp grass-heath at the edge of a valley bog; at Willesborough Lees, where there is a history[113] of its presence and it was last seen in 1984 by Joyce Pitt; and at Chittenden Wood (TR8136) in a boggy ditch on Tunbridge Wells Sand (1944-58, Francis Rose).



***Carex pulicaris* Kent records to 2024 mapped at tetrad level, from BSBI database**

Flea Sedge occurs in a range of habitats in the British Isles; in Kent, at its sole current location, it favours boggy ground, with some base enrichment. In eastern Europe, studies[114] indicate that *Carex pulicaris* is susceptible to decreasing precipitation, so that climate change may be an issue for this species. The rarity of the sedge in Kent is shared with eastern England, where precipitation is lower, so its situation is probably already precarious, but increasing summer droughts may not be wholly deleterious, as there is evidence of it responding well both to autumn-spring floods and to strong falls in groundwater levels in summer.

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[113] The history is not altogether a clear one, as Matthew Cowell mentioned in his *Floral Guide for East Kent* (1839) that the species was present at Willesboro Leas on the authority of the *Catalogue of rare or remarkable phaenogamous plants collected in South Kent* (G.E. Smith, 1829). However, Smith's Catalogue gives the species as present upon turfy bogs, without any location cited, nor is the location given in his manuscript notes under *Carex*.

Its few-flowered spike, with fruit deflexing when mature, cannot be mistaken for any other sedge in the county.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Hothfield	TQ9645, TQ9646	KWT managed reserve, SSSI	(1) 23 June 2022 (2) 12 May 2020 (3) 19 May 2011 (4) 12 July 2000	(1) AL (2) AL (3) LR (4) JS	(1) TQ 968 456. (2) Bogbean Bog TQ 9688 4621. (3) TQ 9682 4564. Main Bog, two flowering spikes noted (thorough search not made). (4) TQ 969 456.
Willesborough Lees	TR0342		1 November 1984	JP	TR 039 424.

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[114] Sotek, Z. et al. (2012) *Carex pulicaris* abundance is positively associated with soil acidity, rainfall and floristic diversity in the eastern distribution range. *Scientific Reports* **12:** 3059.

Carex rostrata Stokes (Bottle Sedge)

vc 15; gone from vc 16

Rarity / scarcity status

Carex rostrata is quite frequent in upland Wales, northern England, Scotland and Ireland. Overall, there are no conservation concerns, whether in England or in Great Britain as a whole, but in south east England there has been a decline, due to habitat loss. In Kent, there is also evidence of decline, and it is very **scarce**. It is a Kent axiophyte, regarded as an indicator of good habitat.

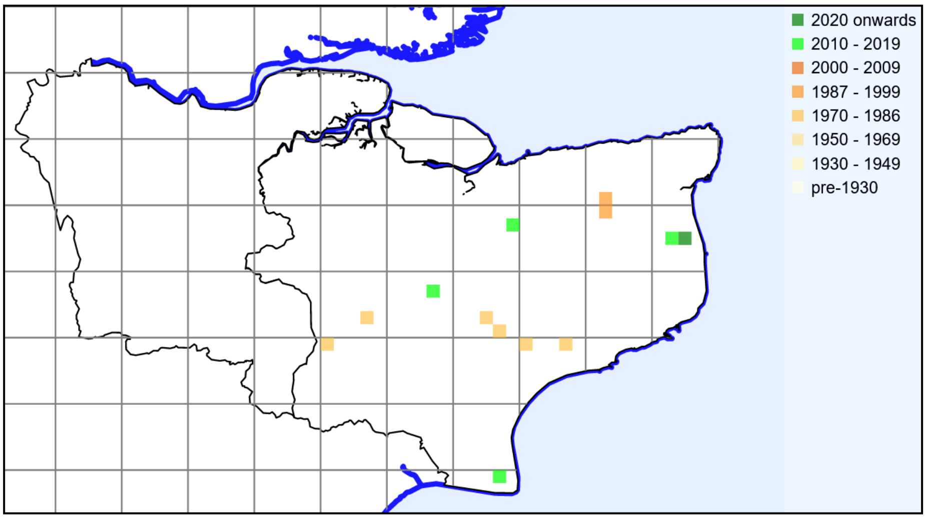
Hothfield. Photo by Lliam Rooney, 5 July 2013

Account

The first published county record for Bottle Sedge is by G.E. Smith, in his *Catalogue of rare or remarkable phaenogamous plants collected in South Kent* (1829). He refers to this species as "By the side of a ditch at the foot of Caesar's Camp, near Folkestone". His manuscript notes (1830-33) also include a reference to the species as growing at Willesborough Lees. Hanbury & Marshall (1899) refer to the species as local in boggy ground and by ponds, with records scattered across the county. In the 1940s and 1950s, Francis Rose collected it widely in vc15, including from Chartham Hatch, Hacklinge, Wingham Fen, Westbere Marshes, Hothfield Common (where there was a long history of occurrence from before 1899), Gibbin's Brook and Friezley (near Cranbrook).

By the time of Philp (1982), the species was regarded as very local and scarce (eight tetrads[115]), with a main distribution from Cranbrook across mid-south Kent to Etchinghill, although survival in the Little Stour catchment was not then recognised). Although particularly searched for in the 1991-2005 survey (Philp, 2010), the species yielded only one tetrad record, at Dungeness. The decline is not quite as drastic as this would indicate, as our 2010-23 records cover five tetrads (six monads). Nevertheless, it will be seen from the BSBI database tetrad records below that there is a swathe of east Kent occurrences from the 1970s, apparently following damp ground on the sands of the Folkestone Formation, which remain ostensible losses.

***Carex pulicaris* Kent records to 2024 mapped at tetrad level, from BSBI database**



The Bottle Sedge is a plant of swamps, normally regarded as preferring acid habitats, but is also capable of being accommodated in base-rich wet areas. Habitats from which Francis Rose collected it included a swampy hollow in open sphagnum / alder carr; swamp and dyke in fen meadow; calcareous fen ditch; swamp in valley bog; and weakly acid valley bog. He considered it a sedge of swamps, ditches, and lake borders, usually on peaty organic substrata, in calcareous to flushed weakly acid waters, and present in a pioneer stage in the hydrosere leading to the formation of fens.

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[115] TQ83E, TQ84R, TQ94T, TR04L, TR04Q, TR05Y, TR13E, TR13U.

Dungeness. Photo by Brian Banks, 13 May 2012

At Dungeness, it was present in 1983[116]) in the Open Pits (no. 1 in TR0718 and no. 6 in TR0618), being rare in swamp-marsh margin. By 1998 It had gone from pit 1 (per Brian Banks), which had become increasingly dominated by willow carr; but the restoration of open fen conditions at pit 6 has encouraged this species, with seed germination having taken place following clearance of shading willows.

In recent times (post 2010), as well as continuing at Dungeness, it has been found still persisting at Hothfield and Ham Fen, at Worth Minnis (where known to Francis Rose in 1960), and it remains on wet peaty ground in Hunstead Wood (where Francis Rose found it in 1956), particularly where the woodland has been opened up but is regenerating.

The species is notable for its fruits (yellow-green and flask-shaped – hence "Bottle Sedge"); it may be confused with *C. vesicaria*, but has less tapered fruits; rounded, rather than acute, ligules; and glaucous dark green (as distinct from mid- or yellowish green) leaves.

Hothfield. Fruiting spike and habitat. Photos by Sue Buckingham, 21 June 2012 and 18 August 2012

Site	Grid reference	Site status	Last record date	Recorder	Comments
North east of Sissinghurst	TQ83E		After 1970, before 1981	Philp (1982)	
River Beult	TQ84		2 August 1980	NH	Within 5km lengths of river either

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[116] B. Ferry & A. Henderson (1984): The vegetation of natural freshwater pits at Dungeness – I: Higher plants. *Transactions of the Kent Field Club* 9: 143-153.

					side of TQ 865 425.
Smarden	TQ84R		After 1970, before 1981	Philp (1982)	
Blean Woods south	TQ8057		March 1984	JP	TR 080 575.
Wattle Wood, Tenterden	TQ8735		7 May 1987	FR & JP	TQ 870 354 or TQ 870 352.
Hothfield	TQ9645, TQ9646	KWT reserve, SSSI	(1) 5 July 2013 (2) 21 June 2012 (3) 23 May 2004 (4) After 1970, before 1981	(1) LR (2) SB (3) BW (4) Philp (1982)	(1) TQ 96689 46088. (2) Patch in standing water at TQ 9668 4608 which covers about 20 x 20 metres. (3) TQ9645. (4) TQ94T.
Hinxhill	TR04L		After 1970, before 1981	Philp (1982)	
Hatch Park	TR04Q		After 1970, before 1981	Philp (1982)	
Hunstead Wood	TR0956		(1) 16 May 2015 (2) After 1970, before 1981	(1) SL (2) Philp (1982)	(1) In open regenerating birch/rhododendron along east facing slope of peaty mire, replaced by *Carex laevigata* in mature Alder carr. Found at TR 09233 56849 (small thin patch in *Sphagnum* pool); TR 09219 56853 (seven metre strip along runnel with *Betula*, *Calluna vulgaris, Carex laevigata*, *Rhododendron* and *Sphagnum* moss); TR 0924 5685 (12 metre patch under high Alder scrub, not flowering); TR09261 56863 (seven metre circular patch under light shade of regenerating Alder). (2) Given as TR05Y.
Dungeness	TR01U		13 May 2004	EGP (Philp, 2010)	A small area of fen. Likely to be the same area as the next entry.
Dungeness	TR0618	SSSI, NNR	(1) 21 June 2019 (2) 13 May 2017 (3) 10 July 2016 (4) 13 May 2012	(1) AWi (2) SL (3) KBRG meeting (4) BB	(1) TR0618. (2) Dungeness RSPB Reserve, west side of Open Pit 6 (*Cladium* Pit), TR 065 183. (3) Only non-flowering plants found, in *Cladium* pit. (4) TR 0659 1835, locally frequent at *Cladium* Pit (pit no. 6), assessed to be more widespread than at any time since the clearing of shading willows allowed it to reappear from the seed-bank fourteen years before. Scattered individuals of *Carex nigra* also present.
Sellindge	TR13E		After 1970, before 1981	Philp (1982)	
Etchinghill	TR13U		After 1970, before 1981	Philp (1982)	
Trenleypark Wood complex	TR1958		12 May 2005	JP	In drying out pond with *C. nigra*, TR 191 585 (may be a generic site reference).
Wickhambreaux	TR2359		5 April 1996	NS	North half of gravel pit lake east of Frognall Fruit Farm.
Newnham Valley	TR2360		20 September 1997	NS	
Ham Fen	TR3354	SSSI, KWT managed reserve	(1) 21 July 2018 (2) 17 June 2018	(1) KBRG / KFC meeting (2) SL	(1) Ham Fen, In good quantity at TR 3372 5441. (2) Hacklinge, west side of A258 (Ham Fen), southern end of dividing ditch (dividing unit 53 and unit 57), TR 3376 54410 to TR 33777 54410. Abundant for 15 metres and in fruit.
Ham Fen	TR3355	SSSI, KWT managed reserve	19 July 2017	SB & SL	Ham Fen. A patch in standing water at TR 3319 5512 at the margin of open fen peat area and adjacent to woodland edge.

Worth Minnis	TQ3455	RSPB reserve	12 August 2023	KFC meeting	Lydden Valley, Worth Minnis RSPB, field along south side of Cornfield Wood, TR 34217 55545. Five metre circular patch in large flooded scrape with little vegetation. Also recorded as at Compartment 36 at TR 34216 55555 (same patch?). [Would tie in with it germinating just after the scrape was created. Recorded by Francis Rose at Worth Minnis in 1960, which suggests more likely in 2023 to have been resurrected from buried seed than brought in by birds (unless brought in by the machinery used to dig the scrape.]

Carex vesicaria L. (Bladder Sedge)

vc 15 and16

Rarity / scarcity status

Bladder sedge is not uncommon generally, being scattered through the British Isles, although less frequent in central England and in the south west. Although its conservation status in Great Britain is still ranked as of 'Least Concern', there have been losses in England and south east Ireland due to habitat changes, and the species is now regarded as **Vulnerable** to the risk of extinction in England. This is a consequence of a decline in the species' area of occupancy in England of 34% between the periods 1930-69 and 1987-99. This trend is not fully supported in Kent; at any rate, it requires a level of interpretation. The species would fall to be treated as **scarce** in the county on the basis of the records given in Philp (2010), but it appears that this understates the extent of its distribution, as since recorded. It is a Kent axiophyte and so an indicator of good habitat.

Leigh / Haysden. Photo by Lliam Rooney, 7 June 2011

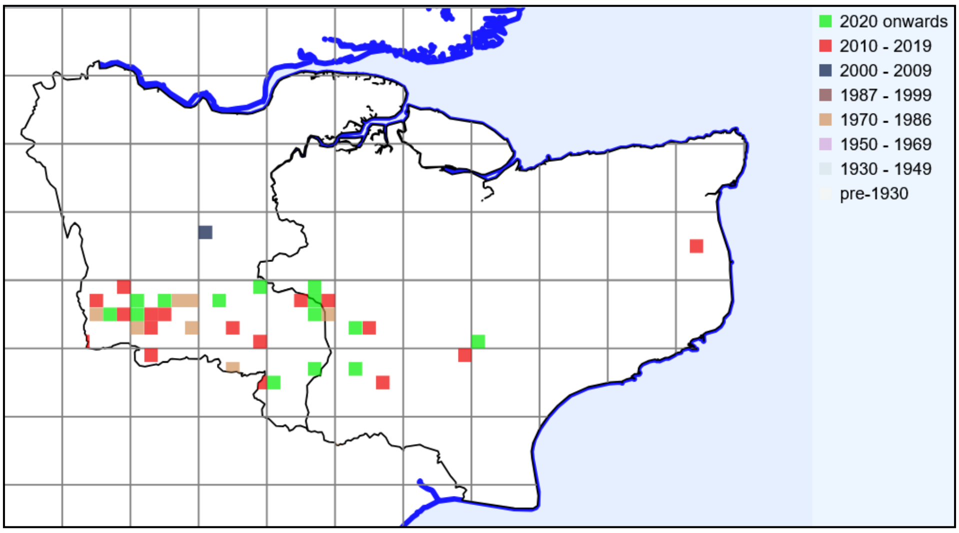
Account

It has been said that Edward Jenner first listed *Carex vesicaria* for the county, in his *Flora of Tunbridge Wells* (1845). He referred to it "in Benhill mill pond and elsewhere". If this is to be equated with Benhall Mill, between Tunbridge Wells and Frant (the remains were demolished in 1964, but the name is preserved in Benhall Mill Road), then the pond lay in vice county 14, outside West Kent. It is not possible to say whether the occurrences "elsewhere" were in Kent, so there is some doubt about the first published record. The next earliest is probably a reference to its presence in a pond at Camden Park, Tunbridge Wells in the *Phytologist* (1855), although earlier preserved material may exist.

Chiddingstone. Photo by Stephen Lemon, June 2010

Hanbury & Marshall (1899) regarded the species as frequent in the Weald, being a plant of river-banks, marshes and wet copses in the southern half of the county. Francis Rose also remarked on its frequency in the Weald, on Weald Clay, where it could be found on river- and stream-banks and pond margins, usually on clayey inorganic substrata of non-calcareous, neutral to weakly acid water. He also commented on rare occurrences in the lower Stour catchment (Mersham le Hatch lake; west of Kingsnorth; Smeeth).

The distribution was fundamentally the same by 1971-80 (Philp, 1982), but the plant was then regarded as rather local and uncommon (present in 15 tetrads). That survey appears to understate the position, since none of these tetrads was located in TQ73 (Cranbrook / Bedgebury), but Joyce Pitt subsequently recorded the sedge in six of the 25 squares within that hectad. In the 1991-2005 survey published as Philp (2010), Bladder Sedge was only recorded in four tetrads which would be suggestive of continued decline; but in the light of subsequent finds, some of which are new, and in particular in the light of survey work by Stephen Lemon, this assessment appears to be overly pessimistic. Indeed, as 31 tetrad records (35 monads) were found in the period 2010-24, it appears that Philp (1982) has given a somewhat better picture of distribution than Philp (2010), albeit that neither survey comes near to matching matches up what is now known.



***Carex vesicaria* Kent records to 2024 mapped at tetrad level, from BSBI database**

Since the sedge is a patch-forming species, in the absence of widespread hydrological change, it is likely that the fluctuation in records does not necessarily represent real change, and certainly does not accord with the picture of national decline; it may simply be that the species has been more effectively recorded recently – indeed, as at the end of 2015, 48% of all Kent records on the BSBI database were dated 2010 or later.

Near Penshurst. Photo by Stephen Lemon, June 2013

Carex vesicaria is restricted neither to acid nor base-rich wetlands and in Kent has been recorded in a variety of habitats, especially the swampy margins of ponds, rivers, streams and lakes; seasonally or permanently wet grazing fields; marshy ground and ditches; and wet woodland — i.e. wet areas often with a degree of fluctuation in levels. It grows in both shaded and open areas, but does not set seed well under shade.

The species is characterised by the long utricles, tapering gradually into the beak. In a vegetative state, it is best recognised by the long, thin, generally light green leaves and creeping habit, confirmed by the purple-red sheaths and long, acute ligule. Any potential confusion with vegetative *Carex otrubae* (False Fox-sedge) in wet habitats may be avoided by virtue of the latter's slightly wider leaf and non-creeping habit. *Carex hirta* (Hairy Sedge), when growing larger than usual, may approximately resemble *Carex vesicaria* in general vegetative appearance, but is hairy, has obtuse ligules and bears sterile shoots appearing as false stems.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Sundridge Park, Bromley (metropolitan vc16)	TQ4171		1985	JP	
West of Cowden	TQ4340		23 November 2014	SL	Alder Carr west of Mill Pond, dominated by *Carex paniculata* herb layer, north of Kent Water, TQ 439 401. Small thin patches under Alder away from dominant *C. paniculata* tussocks.
Westerham Woods	TQ4355		17 June 1982	FR	In wet hollow.
East of Edenbridge	TQ4546, TQ4547		(1) 25 July 2015 (2) 11 May 2014	(1) & (2) SL	(1) (a) Collection of damp wooded clay pits at junction of four monads in depression within field of rape seed, north of Cauk Wood: TQ 45972 46989, patches growing with *Carex remota* and *Carex strigosa* at edge of pit. (b) Site as described in (a) above, TQ 45943 47044, two small thin clumps, one flowering, with *Carex remota* and *Scirpus sylvaticus*, in slightly less shaded area of a pit otherwise densely shaded by *Salix cinerea*. (2)(a) TQ 45292 46556, Approx 10 x 10 metre flowering patch in open western area of pond south of Skinners Farm. (b)TQ 45344 46402, 1 metre flowering patch at the edge of the river, on north bank in sheep grazed pasture directly south of Skinners Farm.
North east of Hever	TQ4645		(1) 22 August 2020 (2) 26 April 2015	(1) & (2) SL	(1) River Eden floodplain opposite Swansnest Island, north-west of Hever, TQ 4682 4558, TQ 4683 4557, TQ 4694 4556, TQ 4695 4556, TQ 4692 4552, TQ 4692 4553. Unmanaged marsh developing along the northern floodplain of the river. Six patches, some sprawling for several metres, beside dried up channels and in dried up marsh. (2)Five separate patches in flower emerging from water (TQ 46917 45530, TQ 46919 45543, TQ 46924 45531, TQ 46934 45582, TQ 46955 45574), flooded marsh north bank of River Eden (excavated since 2009), close to Swan Nest Island.
North east of Hever	TQ4745		3 May 2015	SL	Small non-flowering patch under young sallows near edge of flooded marsh, TQ 47015 45596.
Chiddingstone Castle	TQ4945		3 May 2014	SL	TQ 49193 45795, ten metre strip in flower along edge of flooded ditch below hedge. Wide ditch along north side of large field, west of Mill Farm, by River Eden.
Bough Beech	TQ4949	KWT reserve	7 June 2015	SL	TQ4951 4939, Bough Beech KWT Visitor Centre pond dipping area. Originally planted but naturalised well along edge of pond.
Chiddingstone (Vexour Bridge)	TQ5145		(1) 15 August 2020 (2) 8 June 2019 (2) 12 June 2016 (2) 3 May 2014 (3) 25 August 2013 (4) 2 April 2011 (5) 5 June 2010	(1), (2), (3) & (4) SL (5) KFC meeting (6) & (7) SL	(1) The Grove, Moorden, south of Chiddingstone Causeway, TQ 517 455. Poplar plantation on western side, on River Eden floodplain. Patch with *Carex vulpina* in same place where discovered in 2014. (2) Moorden, Chiddingstone

					Causeway, formerly wet field corner near River Eden, TQ 517 458. Not fruiting, possibly too dry. (3) Moorden Meadow, ditch dividing from marshy field corner that was deepened last year (to 6 feet) into v-shaped channel and now significantly draining marshland, TQ 51710 45855. Small patch of sedge remaining on side of ditch from original larger population there prior to ditch excavation last year. Other patches in nearby marshy field corner not detected and possibly buried under ditch excavations. (4) TQ 51733 45502, six metre square patch in flower with *Carex vulpina*, at northern edge of *Carex riparia* marsh under light shade of mature poplar plantation, The Grove, by River Eden. Also, TQ 516 459 to TQ 517 458, flowering patches of plants, spread around perimeter of flooded area, field corner grazed by cattle, west of Moorden, by River Eden. (5) Moorden valley. (6) Three clumps growing in the ditch to the east of the wet area of grassland (TQ 51695 45845, TQ 51644 45776 and TQ 51640 45756). Also, a 2m x 1m clump of within the wet grassland on its western edge (TQ 51681 45940); associated species include *Carex nigra.* (7) Spread out tussocks in flooded grassland in corner of field, approx TQ 516 459.
Chiddingstone Causeway	TQ5147		(1) 17 June 2023 (2) 23 April 2022 (3) 17 August 2010 (4) 15 July 2007	(1) (2) SL & JPh (3) GK (4) JP	(1) Chiddingstone reserve. (2) Chiddingstone Reserve, Pond 10, TQ 5109 4708. Four growing clumps at back of pond in light shade. Recent colonists from open marsh 20 metres away probably seed spread, after shading large willow was removed a few years ago. (3) TQ 51114 47067, patch c.2m x 1m in wet woodland clearing, site of former brick works (SL has noted a 10m x 4m patch at this location). (4) TQ511471.
Penshurst	TQ5243		6 September 2015	SL	Field along River Eden floodplain, west of Penshurst, ditch along north side of field, TQ 52207 43984, seven metre strip of plants along sides of shallow water-filled ditch with *Lemna minor*, partly shaded above by Hazel, Hawthorn and Elm.
Chiddingstone Causeway	TQ5245		24 June 2010	GK	TQ 52021 45934, patch 3m x 4m in *Juncus* spp. on damp flushed slope above stream with alders.
Langton Green	TQ5339		21 May 2015	JP	
Penshurst	TQ5444		8 June 2013	SL	TQ 54270 44730, close to the River Medway near Ensfield Bridge, marked Chalybeate Spring on OS. 10 x 15 metre open area dominated by *C. vesicaria*, accompanied by *Iris pseudacorus*. Site is on river alluvium, beside a

					wooded hillside on the Ashdown beds fed by a spring running off the slope, damp under foot rather than wet but presumably is very wet through the late winter / early spring.
Leigh / Haysden	TQ5546		(1) 4 May 2019 (2) 15 August 2015 (3) 20 July 2013 (4) 8 June 2013 (5) 27 June 2010	(1) SL (2) JP (3) & (4) SL (5) SB	(1) Leigh Pasture and Marsh, KWT Survey of woodland, marsh and swamp. 12 patches, small to several metres wide as follows. TQ 555569 46154. TQ 55588 46130: with *Calliergon cordifolium* and *Galium palustre*. TQ 55652 46175. TQ 55614 46161. TQ 55718 46161: large patch. TQ 55727 46127: with *Carex vulpina*. TQ 55734 46125: broken patches. TQ 55767 46117: small patches with *Calliergon cordifolium*. TQ 55740 46162: large patch. TQ 55791 46177: tiny patch. TQ 55867 46178: large patch. TQ 55911 46192: small patch. TQ 55942 46196: small patch. (2) (3) Two linear patches in ditch south of and parallel to railway, spread out between TQ55292 46058 and TQ55342 46062 (also *C. vulpina* site). (4) Several sites in wet wood north of railway, including TQ 55736 46175 (large spreading area on wet ground under trees with a few seed heads); TQ55713 46196, (single seeding clump in a pond with *Carex pseudocyprus, C. remota, Oenanthe aquatica, Alisma plantago-aquati*ca); and a few non-flowering patches in other shaded areas within wettest parts of the woodland. (5) LNHS meeting: TQ 55722 46115 (north of railway). Several plants with *Caltha palustris* and other *Carex* spp in very wet shaded marsh.
East of Tonbridge	TQ6247		(1) 28 May 2021 (2) 26 April 2014	(1) & (2) SL	(1) Hartlake Bridge, ditch in field along east side of road, TQ 6295 4742. A few thin patches with *Carex vulpina*, heavily shaded by overgrown hedge and rank vegetation. (2) (a) TQ 62962 47419, two spreading patches growing in between *Carex vulpina*, wet field ditch beneath hedge along east side of road, just north of Hartlake Bridge. (b) TQ 627 473, single long patch (6m x 1m) along stream edge, growing with *Carex riparia*, Mill Stream, close to its junction with River Medway, west of Hartlake Bridge.
Colt's Hill, Capel	TQ6443		29 May 2019	GK	TQ 6418 4388, a scattering in *C. paniculata* swamp in Alder Stream valley.
Hale Street / Yalding	TQ6849		(1) 23 May 2020 (2) 6 July 2013 (3) 12 June 1983, 1989	(1) & (2) SL (3) JP	(1) (a) Hale Street, small field to the north-east, along the west of the railway, TQ 6832 4984. 15 metre colony either side of a short open stretch of a damp ditch at a right angle from the railway, along the

					northern edge of a damp fenny field otherwise dominated by *Filipendula*, unmanaged and scrubbing over. (b) Hale Street, pond north of Medway View, east of the railway, TQ 6826 4939 - TQ 6829 4936. Open northern end to a wet ditch otherwise dominated by *Salix*, running along the north-eastern side of the pond. Thin scrappy patches, some fruiting. (2) A 4m x 4m patch at TQ 68538 49704 west of boardwalk near pond. (3) Pond and marshy area.
Scotney estate	TQ6935	SSSI	12 August 2017	SL	Kilndown Wood, small basin shaped ghyll bordering western edge of wood, steep sides and a wide flat floor, with a chalybeate spring (depicted on OS map) at fault line/junction of the Tunbridge Wells Sand and Wadhurst Clay, TQ 69372 35487. Colony growing in very wet alder carr with *Scirpus sylvaticus, Carex remota* and *Carex elongata*.
Horsmonden	TQ6940		(1) 13 June 2015 (2) 15 June 2013 (3) After 1990 and before 2006	(1) & (2) SL (3) EGP (Philp, 2010)	(1) TQ 69313 40985, small patch with one seed head and another ten metres away under shade of alder carr on southern edge of Furnace Pond. (2) A 5metre patch, thinly spread under alders by a fence line at TQ69047 40941. Further patches in carr near lake at TQ69240 40951 and another patch (the only one with fruit) at TQ 69270 40944 in more open coppice re-growth. (3) Edge of Furnace Pond.
Kilndown	TQ7034		(1) 11 May 2024 (2) 20 August 2020 (3)16 June 2018	(1) SL & MHe (2) & (3) SL	(1) Combwell Wood, TQ 70726 34758. Damp hollow with regenerating alder coppice on the southern edge of Rogers Rough Road. Patch 7-8 metres across, grown significantly since last recorded 2020. (2) Combwell Wood, south-east of Kilndown, TQ 7073 3474. Damp hollow on the southern edge of Rogers Rough Road. Two patches in seed where discovered in 2018, now grown to 1-2 metres across with regenerating Alder. (3) Combwell Wood, Rogers Rough Road, damp hollow within strip of woodland, bordering road, TQ 70727 34765. One small clump with red fibrillose sheaths and long ligule, growing with *Galium palustre*, Lady Fern and Water Figwort. Patch presumably resurrected from the seed bank following tree felling in the hollow a few years ago, still lying on ground.
Bedgebury Park School	TQ7234		12 May 1999	JP	
Bedgebury Forest	TQ7333	Access land	(1) 2004 (2) 26 June 1992 (3) 26 August 1986	(1), (2), (3) JP	Louisa Lake margin; given as TQ 735 330, but TQ 732 329 appears more likely.
Chattenden Barracks	TQ7573		(1) 30 July 2003 (2) 1 June 2002	(1) JS (20 JP & JS	(1) TQ 7499 7335. (2) TQ 755 730 (this may be a

					generic site reference).
Angley Wood, Cranbrook	TQ7636		(1) 04 April 2021 (2) 22 March 2015 (3) 1 August 2007	(1) SL (2) SL (3) JP	(1) Angley Wood, small open fen in valley along western side of Burnt Bank Wood, TQ 7603 3671. (2) (a) TQ 7641 3625, willow carr / sphagnum swamp near public footpath. Multiple small regenerating patches. (b) TQ 7653 3681 to TQ 7644 3686, alder carr / sphagnum swamp. Multiple regenerating spread-out patches including a large patch at TQ 76497 36838. (3) TQ 764 366.
Near Cranbrook	TQ73N, TQ73S		15 May 1995	JP	
Marden Meadow	TQ74S, includes TQ7644	Includes KWT managed reserve, SSSI	(1) 29 August 2022 (2) 15 June 2022 (3) 30 May 2022 (4) 26 September 2020 (5) 30 May 2020 (6) 24 May 2020 (7) 18 May 2019 (8) 4 June 2015 (9) 16 August 2008, 26 May 2003, June 1983. (10) After 1990 and before 2006	(1) LC (2) KBRG meeting (3) AL (4) SL, LC & RC (5) LC (6) SL & LC (7) KBRG / KFC joint meeting. (8)SL (9) JP (10) EGP (Philp, 2010)	(1) Wanshurst Green, east of Marden, TQ76444461. Eastern end of wet woodland, east of Battle Lane. Massive clump in railway ditch along boundary. (2) n. of railway, TQ 7641 4467, as found in 2020, two adjoining clumps at northern edge of wet wood. (3) Marden Meadow FISC survey. (4) Wanshurst Green, east of Marden, TQ 7632 4461. Below the railway at the southern edge of shady wet woodland, east of Battle Lane. Several large patches in scrub, same site as 30 May 2020. (5) Wanshurst Green, east of Marden, TQ 7632 4620. Wet woodland with old pits, east of Battle Lane. A well-grown clump, fruiting between the stream and the railway. (6) Wanshurst Green, east of Marden. Wet woodland with old pits, east of Battle Lane. TQ 7641 4467: two clumps at the flooded northern edge of the wood and field. (7) Marden Meadow KWT Reserve, KBRG / KFC meeting, TQ 7658 4456, open pond at eastern end of reserve beside railway. Abundant around edge of pond. (8) New *C. vesicaria* pond at reserve, overgrown pond in the far little field of the reserve north east corner, next to railway, TQ 76604 44583. Half dozen small/young patches on approx two year *Salix* coppiced, sparsely vegetated northern bank of pond with young *C. vulpina*, *C. otrubae*. Also at TQ 76611 44566 to TQ 76585 44569 was a long-spreading continuous patch running from north east corner to south western corner with abundant *C. vesicaria* and *C. otrubae.* (9) TQ 763 446. (10) By pond, TQ74S.
Stile Bridge	TQ7547		2 May 2015	SL	Small flowering patch in stand of *Iris pseudocorus* at edge of pond just south of River Beult (v.c. 16) at Stile Bridge road junction, opposite pub/restaurant, TQ 75900 47775.
Stile Bridge	TQ7647		(1) (2) 12 May 2018	(1) & (2) SL	(1) Stile Bridge, south of Linton, public footpath going east along north bank of River Beult. TQ 7607

					4788: three spreading patches, including 1 x1 m and 2 x 4 m. TQ 761 4790: single patch. (2) Stile Bridge, north side of river and adjacent fields, east of bridge. Two fruiting colonies of this species, TQ 76069 47899: a broken 10 metre colony along edge of the river & TQ 76080 47910: a single patch at edge of the river. No further colonies of this species found on a search along river bank up to TQ 7633 4813.
River Beult, near Stile Bridge	TQ74T		5 August 2004	EGP & DG	TQ7647, river edge.
Staplehurst	TQ7744		(1) 18 May 2019 (2) 31 March 2019	(1) KBRG / KFC joint meeting (2) SL	(1) (a) In a fenced pond at TQ7715 4462. (b) Fruiting in a shaded pond at TQ 7745 4456 and also in a fenced field pond at TQ 7715 4462. (2) (a) near Duckhurst Farm, group of ponds along railway embankment, TQ 7745 4456. A couple of patches in lightly shaded area at northern edge of one pond almost filled with peat and otherwise overgrown by trees. (b) near Duckhurst Farm, fenced pond in field north of railway, TQ 7713 4460. One patch along the only open edge of pond, otherwise overgrown by trees.
Stile Bridge	TQ7748		8 May 2020	SL	Stile Bridge, south of Linton, public footpath going east along north bank of River Beult. TQ 770 4800: thin broken patch near *Carex acuta.* TQ 7715 4801: single 3m patch.
Chattenden	TQ77L		1 August 2002, 1 June 2002	JP	Bank and ditch below High Camp.
Cross-at-Hand	TQ7846		7 April 2014	SL	TQ 78266 46799, TQ7 8296 46754, TQ 78325 46715, north bank of River Beult, first field east of Hertsfield Bridges. Three thin patches in flower at river edge and in damp ditch, two growing with *Schoenoplectus lacustris*.
South of Frittenden	TQ8139		14 February 2001, 26 June 1999.	JP	Brick Pit Wood.
Hemsted Forest north	TQ8236		9 July 2024	DAN	TQ82501 36289 Entrance to boggy heath, one small clump.
Frittenden	TQ8242		17 August 2018	SB	Beside a pond at TQ 8223 4242
Waterman Quarter, Headcorn	TQ8342		(1) 13 May 2023 (2) 7 May 2023 (3) 10 April 2022 (4) 24 July 2013 (5) 9 June 2000	(1) SL (2) SL & JJ (3) SL (4) & (5) JP	(1) TQ 8333 4267. On western side of middle of three ponds in southern half of wood on west side of minor road. Broken 2 metre patch, not flowering. (2) (a) TQ 8381 4254 and TQ 8386 4252. Waterman Quarter Cottage. Ponds on east side along road. Fruiting. Large clumps around margins of pond. (b) TQ 8362 4266. Shaw and ponds along road, west of Birdsmead. A few shoots along edge of shady pond. (3) Waterman Quarter, TQ 8382 4264. Wooded pond on east side of road. Small patch at base of

					willow in a shady willow filed pond. (4) & (5) TQ8342.
Headcorn Aerodrome	TQ8543		14 July 2013	SL	Four patches by R. Beult, TQ 85772 43137 (in the open on western side of river, some sheep-trampled), TQ85770 43168 (clump on western side within area dominated by *Schoenoplectus lacustris*), TQ 85797 43098 (small clump growing just below footbridge over river, in light shade on eastern side) and TQ 85777 43163 (growing along eastern edge of river in open, no seed).
Parkgate, Tenterden	TQ8635		2 May 2015	SL	Three patches in alder carr on Wadhurst Clay: TQ 86516 35287, TQ 86520 35251, TQ 86535 35247.
High Halden	TQ8737		29 July 1999	JP & GB	TQ 870 375 (query if TQ 873 376 intended).
North of Stubb's Cross, Ashford	TQ9839		11 April 2015	SL	TQ 98597 39414 and TQ 98601 39425, two thin patches under the shade of mature *Quercus*, presumably declining due to increasing shade, in more open south eastern corner of a pond isolated within an arable field. Pond was bordered on southern edge by woods containing ancient woodland indicator species. Shallow middle of pond was mostly dominated by *Salix*.
South Willesborough	TR04A		19 July 2006, July 1995.	JP	Dykes.
Blean Woods south	TR0857		20 May 1988	JP	TR 080 575, in swampy peaty conditions.
Tolsford Hill / Summerhouse Hill	TR1638		11 July 1985	JP	

Carex vulpina L. (True Fox-sedge)

vc 15 and 16

Rarity / scarcity status

Carex vulpina is local in south east England, with very few occurrences elsewhere in the British Isles. It is regarded as rare and **Vulnerable** in terms of risk to the species in England and in Great Britain as a whole. For Kent, it was initially assessed as rare for the purposes of the rare plant register (three tetrad records in Philp, 2010); but enough other sites exist for it to be regarded as neither rare nor scarce. The Kent occurrences are, however, of national significance, the Weald being its headquarters in the British Isles. It is a Kent axiophyte, and so treated as an indicator of good habitat. In 2020 it was selected as one of three indicator species of vascular plants for the Kent Nature Partnership Biodiversity Strategy 2020 to 2045.

It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. It was also a former UK Biodiversity Action Plan priority species, with identified threats as to habitat loss or degradation through natural succession (it can be shaded out), inappropriate ditch management and agricultural drainage, although the planned actions were limited to research and monitoring.

Wanhurst Green. Photo by Lesley Mason, 11 May 2011

Account

Historic trends in the Kent occurrences of *Carex vulpina* are difficult to elucidate, as it was not until 1939[117] that it was clearly separated in Britain from *Carex otrubae* (False Fox-sedge). Earlier literature references to *Carex vulpina* being common in Kent are references to the status of *C. otrubae*, although where preserved specimens exist it is possible to recognize its earlier occurrence. For example, E.S. Marshall collected material by the Eden below Chiddingstone in 1894, probably around TQ 513 457, where it was found by Francis Rose in 1944, and is still present in the neighbourhood. Francis Rose's assessment[118] from the 1940s and 1950s was that it was frequent in pond-borders, ditches and sallow-carrs on the Weald Clay tract from south east of Ashford to the Surrey border, but unknown elsewhere in Kent. Philp (1982) gave nine tetrad records, all in the Weald; but these were reduced to three in Philp (2010)[119], despite specific searches in several former localities without result. Whilst this might suggest a decline, surveys by Stephen Lemon 2013-23 have shown that this was clearly an understatement of extant locations. Many of the old sites still exist and new ones have been found.

Chiddingstone (Vexour Bridge).
Photo by Stephen Lemon, May 2010

We now know more about its Kent status than at any time since Francis Rose's investigations. The table of sites has been expanded to include some pre-1970 locations which have been re-assessed or investigated, in order to give a full picture. Our mapping of data from 2010-24 recording gives a much more meaningful account of the current county distribution of *Carex vulpina* than might be supposed from earlier surveys. The result, 17 tetrads (19 monads) contrasts with the three tetrad records given in Philp (2010) and follows the Low Weald across West Kent via the Eden and Medway catchments, then following the Beult catchment into East Kent, the easternmost record just falling outside the Beult catchment and into that of the Upper Stour.

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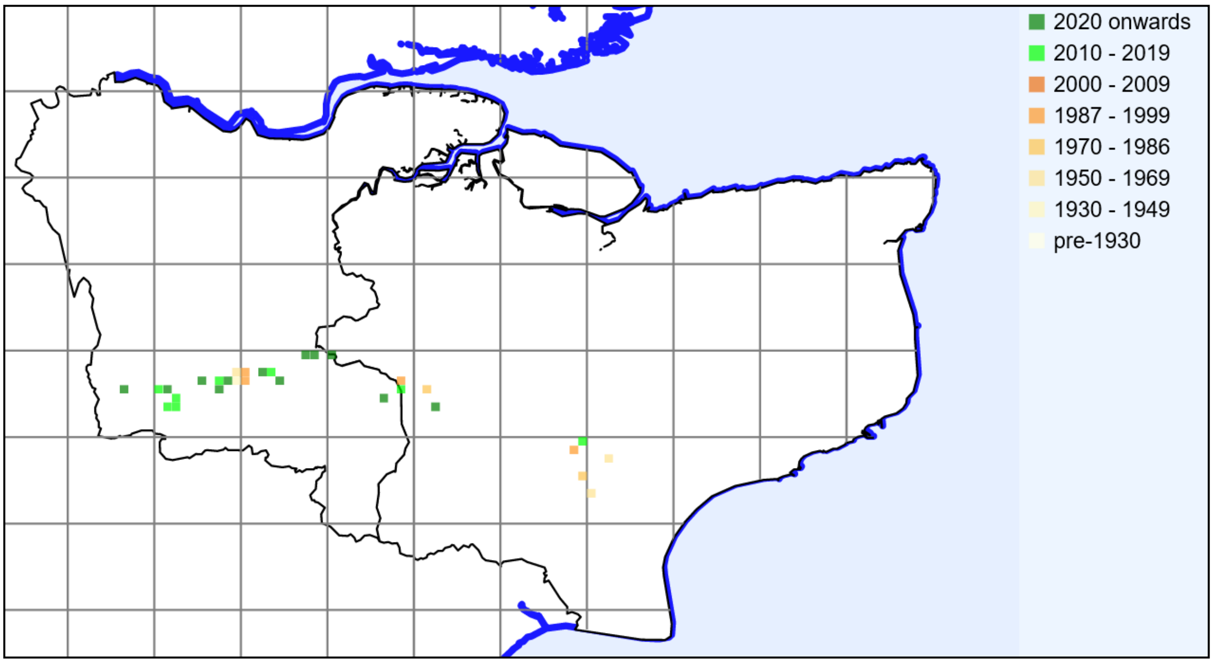
[117] E. Nelmes (1939). Notes on British Carices - IV. *Journal of Botany* 77: 259-266.

[118] From the manuscript *Flora of Kent*. There still exists a list of 29 Kent sites known to FR, with 6-figure grid references.

[119] Subsumed in the following table: at Leigh / Haysden, East Peckham and Marden Meadow.

***Carex vulpina* Kent records to 2024 mapped at monad level, from BSBI database**



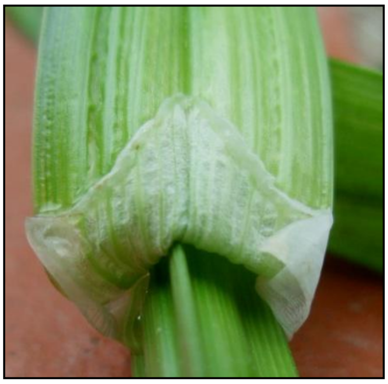
Plants can be difficult to see where vegetation has grown up within a carr or on both sides of a ditch, and winter searching may be more effective, backed up by a subsequent visit when flowering spikes are available.

Habitat, Marden, showing flood tolerance (water present from February to May). Photo by Lou Carpenter, 6 May 2023.

Carex vulpina prefers somewhat wetter conditions than does *C. otrubae*, so that it is likely to be found in a floodplain ditch, whilst *C. otrubae* would favour the bank above. In consequence, *C. vulpina* is susceptible to over-vigorous clearing out of ditches. This is not a straightforward issue, however, as we have evidence that the sedge can act as a pioneer species. Four plants, including a young one, were found in 2014 in a ditch which had only been dug in 2005, linking two established field boundary ditches. It was also found in 2015 at a marsh habitat near Hever which appears not to have existed before 2009. *C. vulpina* usually grows on heavy clay soils, which the Weald affords, weakly acid to neutral, and essentially inorganic, but the geology may not be as significant as the floodplain character of the habitat. One may speculate that the historic position of the species along the Medway (and to a lesser extent, the Eden) may have been influenced by the complex braiding of channels which existed across the floodplain before the riverine system, through straightening, deepening and redirection, became essentially a single course.

Habitat, Tonbridge sportsground. Photo by Alan Heyes, August 2021.

For a fuller consideration of the place of the species in Kent, and threats to it, reference should be made to Stephen Lemon' paper 'Thoughts on the True Fox-sedge in Kent' (*Kent Botanical Recording Group Newsletter* (2021) **14**: 16-18). This notes that *Carex vulpina* in its Kentish Low Weald distribution shows a preference for seasonally waterlogged conditions and our post-2010 records, concentrated in the Eden and Medway floodplains of West Kent, suggest that either loss or inaccessibility of this habitat in East Kent may account for the limited re-finding of historic records there. Its absence from the Medway Valley below Yalding, where *Carex otrubae* (False Fox-sedge) replaces it, may be due to the latter's greater tolerance of brackish conditions, but its absence from the upper reaches of the Medway, above Penshurst, is harder to account for. The ability, through distribution of seed by flooding, to colonise new bare habitat or to re-occupy former habitat when it becomes suitable again, appears crucial for the species' continuance.



Chiddingstone (Vexour Bridge). Photo of ligule by Stephen Lemon, May 2010

The two species, *C. vulpina* and *C. otrubae*, are not easy to separate, although *C. vulpina* may appear more thick-set, more strongly winged along the stems, and wrinkled across the inner face of the leaf sheath. Also its ligule is truncate (acute in *C. otrubae*), although Kent material appears variable as to ligule shape, sometimes pointed, sometimes asymmetrical. The ligule should also be shorter than the leaf width and with a free border overlapping the leaf edge (at least as long as leaf width and not overlapping the leaf edge in *C. otrubae*). There are differences in the cell shape of the utricle surface and (perhaps) in the anatomy of transverse leaf sections.

Hale Street, May 2020. Photo by Stephen Lemon

The position is complicated by the potential for hybridisation between the two closely related species, as the cross *C. vulpina x otrubae* was tentatively identified by E. Nelmes from the Medway near Tonbridge[120]. Plants demonstrating some possible intermediacy have been found in mixed Kentish populations since (e.g. Hever, 2015; Stubb's Cross, 2015; Hale Street, 2020), but it has proved difficult to draw firm conclusions. It is thought that the hybrid is sterile (Foley

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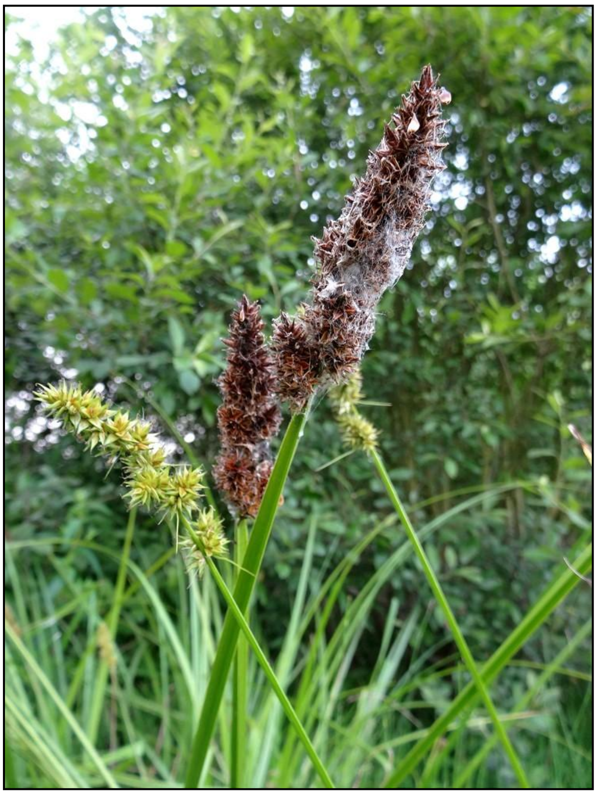
[120] Nelmes, E. (1939). Notes on British Caricies – IV. *Carex vulpina* L. *Journal of Botany* **77**: 259-263.

& Porter, 2015)[121], but possible Sussex material was partially fertile, and fertile plants could easily go unregarded. Many anatomical characteristics of the species show overlap, as do the length and width of the leaf stomata, but the relationship between the two (the stomatal index) appears distinct, and has potential to help with hybrid determinations (Smith & Ashton, 2006)[122]. Nevertheless, the hybrid has not yet been conclusively proved present in Britain.

Chiddingstone (Vexour Bridge).
Photo by Stephen Lemon, May 2010



Hale Street. *Carex vulpina* (the stouter plant with dark brown inflorescence) together with *C. otrubae*. Photo by Stephen Lemon, 14 July 2013.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Edenbridge	TQ4345		1947	FR	Site described by FR as TQ 435 450 by River Eden, above Edenbridge. Investigated by SL, 20 April 2013: the existing field boundary ditch banks were very heavily shaded by trees and thick nettles and the ditch floor was devoid of any vegetation (other nearby ditches on the way down from Edenbridge were in a similar state). The ditch that ran into the River Eden has been filled in and a landing strip for light aircraft runs across it with a Pill Box as the only remaining feature.
North west of Hever	TQ4645		(1) 3 November 2021 (2) 22 August2020 (3) 26 April 2015	(1) GK (2) & (3) SL	(1) TQ 469 455, small plant by deer-track north of Eden at edge of flooded unmanaged marshland. (2) River Eden floodplain opposite

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[121] Foley, M.J.Y. & Porter, M.S., in Stace, C.A., Preston, C.D. & Pearman, D. (2015). *Hybrid Flora of the British Isles*, Botanical Society of Britain and Ireland, Bristol.

[122] Smith, C. & Ashton, P.A. (2006). Distinction between the sedges *Carex vulpina* L., and *C. otrubae* Podp. and the potential for identification of hybrids. *Watsonia* **16:** 15-25.

					Swansnest Island, north-west of Hever, TQ 4691 4550. Unmanaged marsh developing along the northern floodplain of the river. Single plant with *Carex otrubae* by edge of dried up channel, showing mostly asymmetric and some flat ligules with over lapping sheaths. Not the same plant found in 2015 which was not re-found. (2) TQ 46912 45533, one large deer-grazed clump amidst *Juncus* spp., inflorescence just starting to emerge. Flooded marsh north bank of River Eden (excavated since 2009), close to Swan Nest Island.
Chiddingstone (Vexour Bridge)	TQ5045 and TQ5145		(1) 25 August 2013 (2) 2 April 2011 (3) 10 June 2010	(1) KFC meeting (2) SL (3) GK	(1) c.TQ 511 458 under S side of hedge N of Vexour Bridge c.50 metres from road. [Not found, Jube 2021, NA.] (2) In addition to plants noted in 2010-11; another located at TQ 51208 45823 in the eastern section of hedge after it splits in the middle. This was growing within the bushy growth of the hedge and evidently set seed, the hedge preventing cattle grazing them before the seed dropped (other plants were eaten down). (3) (a) TQ 50973 45829, three plants in meadow hedge with ditch beneath, by seasonally flooded depression. Reported first by SL as 'three mature plants with flower spikes, along ditch below hedgerow in area flooded through winter, 05.06.2010'. (b) one plant in south side of meadow hedge with ditch beneath, TQ 51032 45847. [FR also recorded it in 1944 as at TQ 513 457, but (2013, SL) the likely location, by the stream feeding into the Eden, is heavily shaded by scrub and trees along both banks.]
West of Penshurst	TQ5143		17 May 2014	SL	(a) TQ 51902 43781, one large clump. (b)TQ 51894 43782, three clumps (pointed ligules with wrinkled / overlapping sheaths). (c) TQ 51833 43753, three clumps. (d)TQ 51833 43753, single clump. All clumps in flower in ditch below hedge at field edge, close to Salmons Farm track, west of Penshurst. Ditch dry and quite shaded, with lots of *C. otrubae*.
Gillridge, Penshurst	TQ5144		1944	FR & JEL	Site described by FR as TQ 515 441, marsh below Gillridge, west of Penshurst. [Not re-found, SL, June 2013: is a very small marshy area within woodland, completely shaded by large trees.]
Chiddingstone (Vexour Bridge)	TQ5145		(1) 13 April 2022 (2) 15 August 2020 (3) 3 May 2014	(1), (2 & (3) SL	(1) The Grove, Moorden, south of Chiddingstone Causeway, TQ 5174 4551. Poplar plantation on western edge, on River Eden floodplain; 7 grazed clumps (4 large) where found in 2014, in dry marsh at northern edge of *Carex riparia*

					marsh. (2) The Grove, Moorden, south of Chiddingstone Causeway, TQ 517 455. Poplar plantation on western edge, on River Eden floodplain. Approximately five large clumps with *Carex vesicaria* in same place where discovered in 2014. (3) TQ 51733 45502, Five large clumps in flower (with pointed or asymmetric ligules) at northern edge of *C. riparia* marsh under light shade of mature poplar plantation with five smaller clumps set back in slightly more shade, growing with *C. vesicaria* and one small clump of *C. otrubae*. The Grove, by River Eden.
Penshurst	TQ5243 & TQ5244		(1) 28 May 2013 (2) 19 May 1973	(1) SL (2) RW	(1) Two clumps close to each other, straddling the monad boundary – TQ 52112 43997 and TQ 52112 44000. One larger than the other, both around a small pool which is part of a flooded ditch system running along the back of the field and mostly is heavily shaded by trees. (2) TQ 520 438, River Eden Bridge. [Not re-found, 2013, SL. There was also a 1961 record by FR, TQ 521 438, also not re-found.]
Leigh / Haysden	TQ5546		(1) 23 April 2022 (2) 7 June 2021 (3) 4 May 2019 (4) 25 April 2015 (5) 15 August 2014 (6) 20 July 2013 (7) 8 June 2013 (8) 27 June 2010 (9) 10 June 2001 (10) 1991 (11) 14 June 1986	(1) SL & PHo (2) NA (3) SL (4) KFC meeting (5) JP (6) & (7) SL (8) SB (9) RW (10) JP (11) BSBI sedge course	(1) Leigh Pasture and Marsh (SE54), east of Leigh, north of railway, TQ 556 461. Southern edge of swamp in light shade, with *Carex vesicaria* and *Iris pseudacorus*. Plants noted all around site in usual areas but full count not attempted. (2) TQ 55723 46130 in marshy pool. (3) Leigh Pasture and Marsh (SE54), KWT Survey of woodland, marsh and swamp. 10 clumps as follows. TQ 55526 46153: 1 large clump in open area cleared 4 years ago. TQ 55652 46175: 1 large clump in open marsh. TQ 55624 46163: 1 large clump in strip of open / flooded marsh. TQ 55727 46127: 1 large clump with *Carex vesicaria* in shaded marsh. TQ 55746 46198: 3 large clumps in open marsh. TQ 55760 46199: 1 large clump. TQ 5574 4619: 1 large clump along northern edge. TQ 5585 4619: 1 large clump in old willow carr. (4) (a) TQ 550 460, a single clump at the edge of the west side of a water-filled ditch under light shade of trees, flowering in ditch running north/south, parallel with public footpath, south of railway, north of River Medway. (b) TQ 55255 46148, a single low /weakly growing plant found in an atypical habitat , a raised path next to railway in field near entrance gate into marsh. (5) Apparently land north of railway. (6) Eight small clumps, all along northern edge of dry ditch south of and parallel to railway, spread out

					between TQ 55292 46058 and TQ 55342 46062 (cf. 2001 and 1986 sightings). All of the clumps were heavily grazed and only three small seed heads were found on one of the plants. Heavy grazing probably meant some plants were missed. The grazing must help prevent rank vegetation taking over the ditch but inhibit reproduction by seed in the long term. There may be a culvert link to the northern side of the railway where there are other records. (7) TQ 55767 46193, single large clump at edge of pond with a few seed heads.[not refound, June 2021, NA]. (8) LNHS meeting. TQ 55698 46125, seven plants with *C. pseudocyperus* in a very wet shaded marsh. (9) TQ 552 460, some 20 plants along drainage ditch. (10) c. TQ 550 462, north of railway [not re-found, 2014, SL]. (11) TQ 553 460; c. 15 flowering spikes surviving cattle grazing; dryish ditch parallel to railway.
Haysden	TQ5746		14 November 2014	SL	Single clump growing at waters' edge of the Ballast Pit, immediately south of railway at TQ 57218 46002. Associates: *Mentha aquatica* and *Crassula helmsii* with a nearby clump of *Carex otrubae,* and *Carex pendula* and *Carex remota* on the bank above at north western most point of Ballast Pit close to entrance gate from public footpath. Second smaller clump nearby at TQ 57269 46005 further along wooded northern edge of pit between fishing swims under light shade of mature *Quercus robur* and clumps of *Carex otrubae* close by. All further clumps examined around whole Ballast Pitt edge were *C. otrubae*.
Tonbridge	TQ5846	Council-owned sportsground	(1) 27 July 2023 (2) 8 May 2022 (3) 7 June 2021 (4) 12 June 2020 (5)1 July 2016 (6) 21 June 2013	(1) AH (2) AH (3) NA (4), (5) & (6) SL	(1) TQ 5854 4635. A large colony growing close to the hedge lining the ditch. Significantly more plants than in 2022 with plants on both sides of the ditch. (2) TQ 58549 46359 for sample clump, Tonbridge Playing Fields. Has spread further since last recorded in 2021 and is now present on both sides of the ditch. (3) TQ 584 464 to TQ 584 465, fruiting and locally abundant with *C. spicata* in patches along dry ditch, Tonbridge Park. (4) Tonbridge Racecourse Sportsground, TQ 584 464 to TQ 585 463. Colony in ditch dividing sportsground still very large and ditch waterfilled for a short section with fish fry. Later same day all vegetation along entire length of ditch cut to the ground and the hedge trimmed back with tractor mounted cutter arm. (5) Tonbridge Racecourse Sportsground: hedge, bank and

					ditch dividing sportsground, TQ 58422 46533. Furthest outlying plant (away from river). (6) At least 120 plants (the precise number being unascertainable due to tussocks growing bunched together) in a ditch at the Racecourse Sportsground near the Medway. The location is from TQ 58460 46472 to TQ 58618 46276, roughly from a sports building to the mouth of a brick-lined ditch by the river. Most plants were growing along the ditch-side with a hawthorn hedge above and presumably gaining protection from this; only a few plants were on the other, mown side of the ditch, which feeds into the Medway via a connecting drain. Plants dominated where the ditch floor is damp to water-filled, being reduced to just a couple of plants where bank becomes brick-lined. Tonbridge & Malling Council have agreed to take the sedge into account in their management plan.
Below Tonbridge	TQ5946		8 July 1944	JEL	Since 1944 there has been much urban development, including an industrial estate, around streams and river systems, which have also developed significant marginal tree cover. There is [SL, 2014] little prospect of a successful search. A further record (TQ 599 467) by FR described as below Tonbridge in side ditches of Medway could not be re-found [SL, 2013]. The ditch running from the road into the southern side of Medway was heavily shaded and ditch banks for most part could not be seen. Fields on either side of ditch were starting to scrub over.
Below Tonbridge	TQ5947		May 1963	RW	Given as at TQ 598 478, although the area is within a housing estate north of Tonbridge and contains recreational grassland and a small woodland, apparently little changed since 1960. [Investigation by SL, 2014.]
East of Tonbridge	TQ6046		12 August 1998	RP	(1) TQ 602 468, one clump on north riverbank, low down and rooted in channel, more or less opposite a side channel entering on the south bank. Not re-found, SL 2014. There has been a change in land use from cattle grazing in 1980s to arable around this grid reference and some loss of ditches between 1990 and 2003. (2) TQ 603 469. Several clumps, maybe 30 plants, in dry ditch north of river with overhanging *Salix x fragilis*, etc., surrounded by arable.
East of Tonbridge	TQ6047		12 August 1998	RP	TQ 604 470, one clump low down on north riverbank, rooted in channel but mostly above normal water level. East of Tonbridge (the former Tonbridge Marshes area) appears to have been affected by land use

					changes from cattle grazing to arable (with some associated ditch and hedge removal), and increased domination of ditches by trees. [Not found, 2013 and 2014, SL, as also FR 1950 record TQ 604 672.]
East of Tonbridge	TQ6247		(1) 30 May 2021 (2) 28 May 2021 (3) 12 June 2014 (4) 26 April 2014 (5) 11 August 1998	(1) SL (2) SL (3) KBRG meeting (4) SL (5) RP & CP	(1) Hartlake Bridge, north bank of river, west of road, TQ 62700 47192. Damp shady hollow *with Iris pseudacorus*, very close to bank of river. Two very thin clumps, each with a single inflorescence, partly buried by brush and logs. Down from 1 large and 2 small clumps recorded on 26.04.2014 and 10 clumps on 11.08.1998. Hollow in danger of eroding into river. (2) Hartlake Bridge, ditch in field along east side of road, TQ 6295 4742. One small plant with *Carex vesicaria,* heavily shaded by overgrown hedge and rank vegetation. (3) In a field ditch at TR 62962 47424 with *C. vesicaria*, an old FR record (4)(a) TQ 62691 47194, seasonally flooded shaded hollow beside public footpath and River Medway, west of Hartlake Bridge. One large clump and two small, ground bare other than *Iris pseudacorus*, due to shading by a ring of trees around hollow. [This may correspond to FR's 1952 record under the description of hollow by River Medway.] (b) TQ 62962 47419, wet field ditch beneath hedge along east side of road, just north of Hartlake Bridge. Three clumps close together growing beside to *Carex vesicaria*. [FR probably saw it in the same ditch in 1952, but recorded it as TQ 603 473 when TQ 630 473 was probably intended.] (5) TQ 626 471, Hartlake Bridge, sheltered *Impatiens glandulifera*-dominated depression on north bank of Medway, about 10 clumps. There is also a 1961 record (RD) for TQ 628 473 on north river bank, Hartlake Bridge, which could not be re-found by SL in June 2014. Bank here is mostly wooded, but was clear in 1960.
East of Tonbridge	TQ6347		1 June 2014	SB & SL	A cluster of non-flowering plants at TQ 63610 47236 in a wooded area, Ottershaw.
North of Five Oak Green	TQ6446		(1) 28 May 2021 (2) 12 June 2014	(1) SL (2) KBRG meeting	(1) River Medway, gravel pits south of East Lock, TQ 6432 4697. Ditch running north-south divided by a track, formerly part of a field, created during gravel extraction and to the west of a large gravel pit. Three flowering tussocks on open southern section of ditch at edge of track, single tussock in shade in northern section. Species survives despite ditch more or less becoming densely shaded by *Salix cinerea* since first recorded at KBRG meeting on 12/06/2021.

					(2) Four or five young plants along a ditch a ditch from TQ 64033 46859 to TQ 64015 46917. The ditch was dug in 2005, indicating the potential for severe clearance of rank vegetation from ditch banks among modern agricultural fields.
Whetsted	TQ6542		1944/1961	FR	TQ 658 642. [Not found 2014, SL].
Broadbridges	TQ6748, TQ6848		1948 & 1944	FR	1. Site (1948) described by FR as TQ 677 483, gravel pits east of Broadbridges. This grid reference is incorrect as no gravel pits existed here in 1940 or 1960. The only gravel pits hereabouts in 1940 were centred around TQ 683 484. It is likely this was the site that operated as Yalding Rubbish Tip during the late 1960s and most of the pits are now infilled and capped. Only those at the northern end remain and are now almost completely wooded. The pits at the western end still exist and are not completely wooded but did not exist in 1940 and are not accessible, being fenced fishing lakes. [Investigation by SL, 2014.] 2. Site (1944) described by FR as TQ 674 482, ditches south of Broadbridges. The roadside stream is the only obvious ditch at this grid reference and was searched (2014) from where it crosses the road, south to where it splits at the end of the wood next to the A228. Not obviously unsuitable in places but since 1944 the area to the west of the ditch has been converted from fields to gravel pits and then to an Industrial Estate. [Not re-found, 2014, SL.].
near East Peckham / Hale Street	TQ6749		(1) 23 May 2020 (2) 18 June 2016 (3) 15 August 2014 (4) 14 July 2013 (5) 13 July 2013 (6) After 1990 and before 2006 (7) 2 May 1998	(1), (2), (3), (4) & (5) SL (6) EGP (Philp, 2010) (7) RS	(1) Hale Street, quarry to the east. Scrubby rabbit grazed meadow on the east side of the A228. TQ 6770 4945: single clump. TQ 6771 4944: three clumps. All in rush dominated north-west corner of field, growing with *Juncus inflexus* and *Carex otrubae*. (2) Flooded silt dump in quarry workings. Single tussocks at TQ 67876 49656 and TQ 67914 49487 still present along eastern edge of silt dump and area becoming dominated by *Salix*. Tussock previously recorded along western side at TQ6 7855 49562 could not be re-found. (3) Single new large clump at northern edge of silted pond close to stream inlet at TQ 67876 49656. Associates *Lythrum salicaria, Lycopus europaeus, Mentha aquatica* and *Alisma plantago-aquatica*. [Site destroyed by May 2019, SL.] (4) Two tussocks near edge of silt dump area, one next *to C. otrubae*, TQ 67855 49562 and TQ 67914 49487. [Site destroyed by May 2019, SL.] (5) TQ 67945 49531, a single plant

					growing in a damp strip of land used as silt dump. Apparently near a 1998 record, but landscape here has changed completely. [Site destroyed by May 2019, SL.] (6) Given as in a ditch near East Peckham TQ64U. (7) TQ 679 496. [Not re-found, 2013, SL; likely to have been in a hedgerow since grubbed out and site buried by quarry works.]
Yalding	TQ6849		(1) 23 May 2020 (2) 25 April 2015 (3) 4 May 2014 (4) 28 July 2011 (5) 11 August 1998 (6) 13 June 1985	(1) SL (2) SL (3) SL (4) LM (5) RP & CP (6) RD	(1) (a) Hale Street, small field to the north-east, along the west of the railway, TQ 6832 4984. Five clumps either side of a short open stretch of a damp ditch at a right angle from the railway, along the northern edge of a damp fenny field otherwise dominated by *Filipendula*, unmanaged and scrubbing over. (b) Yalding Fen, pond cleared recently on the eastern edge of the railway, TQ 6840 4980. Single tussock along bank with *Carex pseudocyperus* and *Lysimachia vulgaris*. (2) Yalding Fen, wet grassland near bridge, TQ 6851 4957. Single clump. (2) Yalding Fen (TQ 68477 49670): one clump, 20 metres from existing known clump but flowers less advanced, both growing in *C. acutiformis* stand. (3) The 2011 site revisited, TQ 68472 49684, in northernmost field at southern edge of *C. acutiformis* dominated swamp. (4) TQ 6847 4968 next to *Carex acutiformis* swamp; there is a history of sightings. (5) TQ 680 496, some 50-60 plants along c.25m of moderately shaded, dry but winter-flooded ditch, vulnerable to development. [The field/ditch layout here has disappeared with clearance and spreading of excavated material, so this site is destroyed, 2013 (SL).] A 1968 record for TQ 683 497 could also not be traced (SL, 2014), the relevant ditch being heavily shaded, banks with rank vegetation and fallen willows. (6) TQ 681 495, carr. (FR recorded it at a pond and wet copse for this grid reference from 1948 to 1985.) [Not found, but heavily shaded, 2013, SL.]
Yalding	TQ7048		1944		FR record for TQ 709 481, ponds by B2162 south of Yalding. [Not re-found (2013, SL), grid reference does not match well, and nearby ponds with limited or no access, some converted to garden or heavily shaded.]
Yalding	TQ7049		(1) 8 June 2020 (2) 17 July 2013 (2) May 2012	(1) SL (2) PS	(1) Four tussocks centred on TQ 70042 49792 in 5m x 5m break in woodland canopy under power lines through damp hollow, a small wooded area next to sports field. Tussocks not robust, but

					competing with *Iris pseudacorus* and their habitat surrounded by trees and rank vegetation, mostly *Urtica dioca* and *Filipendula ulmaria*. (2) Suspected sighting, for which full referee confirmation could not be obtained.
North of Marden	TQ7345		1952		TQ 739 459, ponds.
Marden (south of railway)	TQ7644	KWT reserve	(1) 4 June 2024 (2) 18 May 2019 (3) 4 June 2015 (4) 13 April 2014 (5) 2001	(1) AL, MA & PW (2) KBRG / KFC joint meeting (3) SL (4) SL (5) EGP & MP	(1) TQ 7661 4455, Marden Meadow. A large patch on the far side of the pond. (2) TQ 7658 4456, open pond at eastern end of reserve beside railway. Several tussocks. (3) New *C. vulpina* pond at Marden Meadow KWT reserve, discovered by JP (on 1 June 2015, one clump in marshy grass on the south side of an overgrown pond in the far little field of the reserve north east corner) when visiting with her class. Subsequent visit by SL noted the pond was next to the railway and had the following *C. vulpina* population, (a) TQ 76586 44562, one clump on vegetated south side of pond (probably clump seen by JP on her visit) *with C. vesicaria* and *C. otrubae*, (b) TQ 76608 44578, single small young clump on approx. two year *Salix* coppiced, sparsely vegetated northern bank of pond with young *C. vesicaria* and *C. otrubae*, (c) TQ7 6609 44565, eight large fruiting clumps clustered together in densely vegetated north eastern corner of pond with abundant *C. vesicaria* and *C. otrubae*. (4) TQ 76291 44593, growing in the open near the western edge of a pond which sits beside the railway and is fed from a stream running parallel with the railway. One large clump with a few spikes and 3 or 4 much smaller satellite clumps immediately around it towards the pond edge. (5) Pond at Marden Meadow.
Marden (north of railway)	TQ7644		(1) 27 June 2023 (2) 15 June 2022 (3) 3 May 2022 (4) 24 May 2020 (5) 10 May 2011	(1) LC (2) KBRG meeting (3) AL (4) SL & LC (5) LM	(1) TQ 76058 44749 one plant, TQ 76098 44738 one plant, TQ 76095 44738 one plant, TQ 76101 44744 one plant, TQ 76107 44741 one plant, TQ 76104 44729 two plants, TQ 76101 44732 one plant, TQ 76104 44736 two plants, TQ 76110 44742 three plants, TQ 76113 44736 one plant, TQ 76119 44739 one plant, TQ 76116 44736 two plants. A thorough survey, some small plants, others large, definitely more than previous year. (2) TQ 76057 44748, large tussock by *Salix cinerea* in tall grass and rushes of wet meadow. Newly found as additional to other clumps in vicinity, counted as 8 by LC over previous winter. (3) TQ 7658 4456. Marden Meadow FISC survey. Big plants beside the pond by the railway.

					(4)(a) Wanshurst Green, east of Marden, TQ 7609 4472. Field immediately west of Battle Lane. Single clump in rushy area with large *Salix* bushes. (b) Wanshurst Green, east of Marden, TQ 7619 4470. Wet woodland with old pits, east of Battle Lane. Six clumps just inside fence under light shade. [May-June 2023, apparently no longer present (LC), perhaps due to long hot dry spell in 2022, site now dominated by *Oenanthe crocata*.] (5) Wanshurst Green, off Battle Lane at TQ 7611 4473, three large healthy clumps in damp tussocky grassland amongst willow scrub, on the opposite side of the railway to the well-known Marden Meadow site.
Stile Bridge	TQ7747		1946	FR	Site described by FR as TQ 770 471, ditch by A229 south east of Stile Bridge, Marden. A garden centre occupies the site of this grid reference and there is no ditch next to the road here. In 1940 it was a field with a hedge and wide road side verge, so the original site is presumed destroyed (SL, 2014).
Cross-at-Hand, Staplehurst (vc16)	TQ7845		27 April 2014	SL	TQ 78438 45410, ditch by wide verge along western side of A229, at Sweetlands Farm junction, north of Staplehurst. One large clump at the southern end of a water filled ditch with abundant *C. otrubae*. FR recorded it here in 1946 at TQ 784 455 as a ditch by A229, Sweetlands Corner.
Cross-at-Hand, Staplehurst (vc15)	TQ7846		1979 and 1991	EGP	Hertsfield Bridges, River Beult. [Not found by SL, 2014, but may have been at wet ditch parallel to northern approach to bridge, in first field east of Hertsfield Bridges.]
Leighbridge	TQ8145		1979	EGP	FR also recorded it from a ditch at TQ 814 454 in 1962. [Not found 2014, SL; ditch may have formed part of a wooded field boundary since grubbed out.]
South west of Headcorn	TQ8243		(1) 10 April 2022 (2) 23 March 2014	(1) & (2) SL	(1) Water Lane, south-west of Headcorn, TQ82354327. Single sparse patch on bed of open damp ditch on east side of road. (2) In ditch beside hedge along eastern side of Water Lane, where roadside grass verge widens out. Small clump on bed of muddy ditch with flower spike starting to emerge, TQ 82356 43274. Larger clump on edge of same muddy ditch with no flower spikes and a small clump a metre away with flower spike, TQ 82366 43255. Re-finding of old RC record listed by FR..
North west of Smarden	TQ8643		1949	DMcC	TQ 863 438, roadside ditch north of Marley Farm. [Not re-found, SL, 2014; some suitable sections of ditch present, others shaded.]
North of Tenterden	TQ8735 or TQ8634		1987	FR & JP	Marsh north of Breaches Pond, given as TQ 872 353, but TQ 867 349 is more likely. [Not re-found

					2014. It appears that this location, originally a field with a stream running through, was by 1990 converted into a pond.]
West of Smarden	TQ8742		1956	FR	TQ 877 423, River Beult. [Not re-found 2014, SL: north side of river inaccessible, both banks steep and thickly vegetated, more trees than at time of record.]
East of Langley, Smarden	TQ8940		1956	RC	TQ 893 406. [Not re-found, 2014, SL. Tree-lined shallow ditch is present, short-grazed by horses and shaded in places.]
South of Bethersden	TQ93J		After 1970, before 1981	Philp (1982)	[Not re-found April 2017, SL.]
East of Vitters Oak, Bethersden	TQ9540		1955	ES	Roadside ditch, east of Vitters Oak. [Not re-found 2015, SL; *C. otrubae* present.]
South of Willowbed Farm, Ashford	[TQ9838]		5 July 1989	RWD	Grid reference given (TQ 989 385) is in an unsuitable area, with a shallow pond but no ditches. [Not re-found 2015, SL; and may be in error for TQ 989 395 (see TQ9939 below).]
Shadoxhurst, Birchett Wood	TQ9935		(1) 1945, 1985 (2) 19 June 1970 and 1979	(1) FR (2) RD	(1) TQ 992 358, by former B2070 near Orlestone. (2) TQ 992 359.
Stubb's Cross, Ashford (south of Willowbed Farm)	TQ9939		(1) 9 May 2015 (2) 1 June 1987	(1) SL (2) RF & LBB	(1) TQ 99003 39568: ditch along north side of field, east of Long Length road, Stubb's Cross, south of Willowbed Farm, Ashford. One large clump on along field ditch along the north side of the field, close to the first large oak tree. Many intermediate fox sedges and *Carex otrubae* in same ditch surrounding and in the nearby ditch along the western side of field. *C. vulpina* was in full flower in contrast to other fox sedges present which were slightly behind. Re-finding of 1987 record. (2) TQ 990 395, field ditch east of Long Length road; one clump near road; six more near the first large tree in field boundary running south east. Associated species included *Alisma plantago-aquatica, Alopecurus geniculatus, Carex otrubae, C. spicata, Glyceria fluitans, Juncus effusus, Mentha aquatica, Myosotis laxa, Oenanthe crocata, Ranunculus repens.* There are earlier records for this area.
Kingsnorth	TR0237		9 June 1968	RD	TR 020 378.

Carlina vulgaris L. (Carline Thistle)

vc 15 and16

Rarity / scarcity status

Widely distributed in England, Wales and central Ireland, but with a more attenuated, generally coastal distribution, elsewhere in the British Isles, *Carlina vulgaris* is not regarded as at particular risk in Great Britain as a whole, where its status is one of 'Least Concern'. However, in England there is some evidence of decline, and it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 25% in the likelihood of recording the species. In Kent, it is neither rare nor scarce but, comparing the periods 1971-1980 and 1991-2005, Philp (2010) shows a decline in tetrad records of 20% over those given in Philp (1982). It is a Kent axiophyte, an indicator of good habitat.

Dover. Photo by Geoffrey Kitchener, 12 October 2014

Account

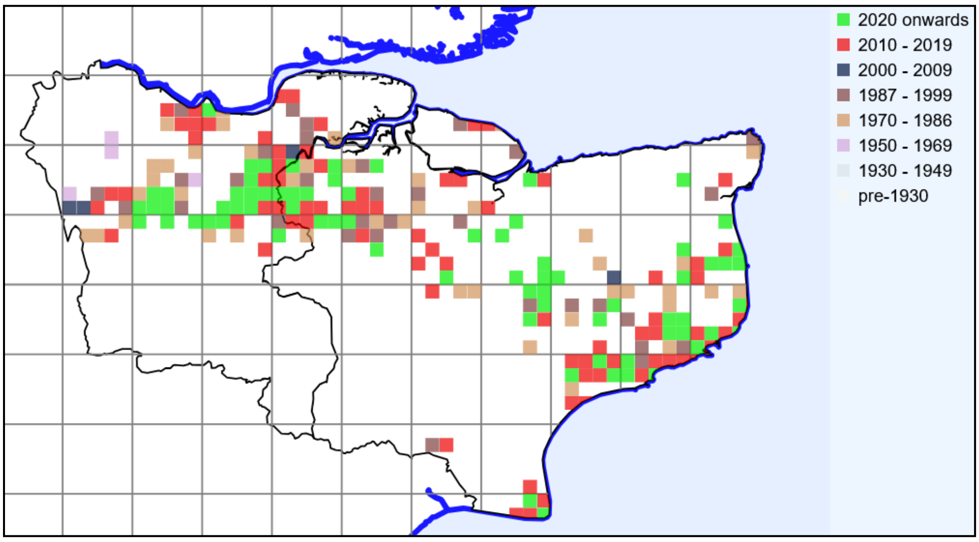
The first published Kent record for Carline Thistle was Thomas Johnson's encounter with this species between Gravesend and Rochester on 13 July 1629, given in his *Iter Plantarum* (1629). Johnson was also responsible for the preparation of an expanded version of John Gerard's *Herball* published in 1633, in which he described the species as growing 'upon Black-heath and in many other places in Kent'. Hanbury & Marshall (1899) referred to *Carlina vulgaris* as plentiful on downs, banks, roadsides, etc., especially on the chalk, in north west Kent and in the east and south east of the country.

Despite the reference to chalk, however, at least half of the records cited by Hanbury and Marshall are from sand: Blackheath (mentioned above); Seasalter (given by Matthew Cowell in his *Floral Guide for East Kent*, 1839, 'on the sands nr. the Preventive [Coastguard] Station'); Tunbridge Wells Common ('very plentifully' according to Thomas Forster in his *Flora Tonbrigensis*, 1816); Rusthall Common, where reported by Walter Reeves of Brixton; and Hawkhurst, where seen by the collector J. Cosmo Melvill. It is surprising that most of these sand-derived records are from locations where there is unlikely to be any calcareous influence, but this appears to be part of the potential of *Carlina vulgaris* which has been manifested more in the past than it is at present (and is also reflected in some records in the older Floras for neighbouring counties). At any rate, *Carlina vulgaris* can no longer be found at Blackheath, Hawkhurst, Rusthall Common and Tunbridge Wells Common.

Habitat, chalk cliff slopes above Samphire Hoe.
Photo by Geoffrey Kitchener, 12 October 2014

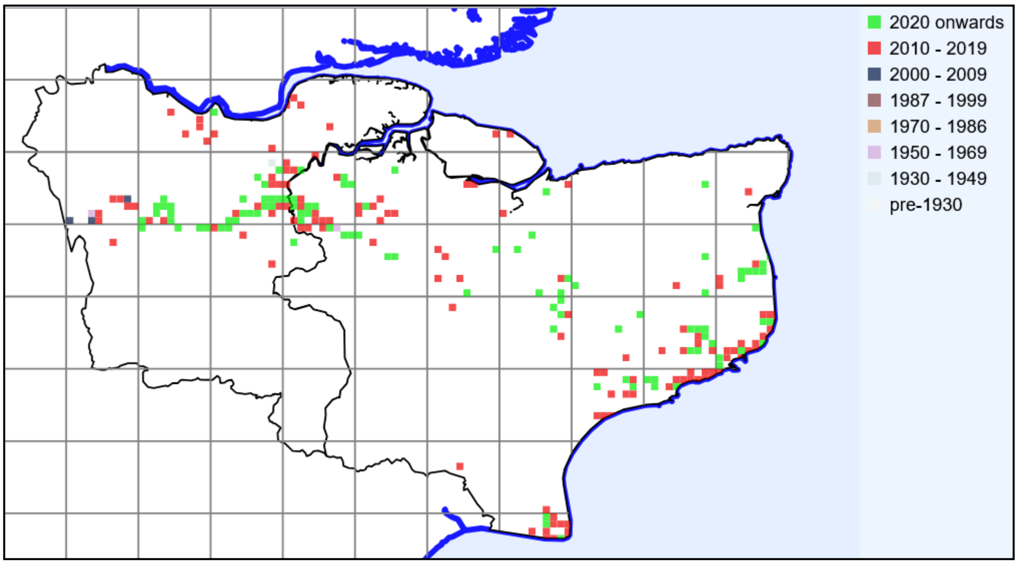
In Philp (1982), Carline Thistle was noted in 154 tetrads, being locally common on grassland or undisturbed waste ground on the chalk and occasionally in similar habitats on other calcareous soils. Records had reduced to a total of 123 tetrads in Philp (2010), in which the county distribution is shown as being broadly similar, on the chalk on dry, rather infertile grassland, cliffs and quarries, and occasionally on sand-dunes and other calcareous soils. Records for 2010-24 amount to 149 tetrads (226 monads), and so we have caught up with and exceeded the 1991-2005 position. Accordingly, it does not look as though there is continuing decline after then. While the following distribution map (at tetrad level) suggests substantial losses from the 1970s along the Downs, much of these are off-set by gains, so the position is more complex than appears. One might have expected more losses, not just through scrubbing over of chalk grassland but also in that the species in this habitat hasa significant negative relationship with increasing atmospheric nitrogen deposition[123].

***Carlina vulgaris* Kent records to 2024 mapped at tetrad level, from BSBI database**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

The historic position is best viewed from tetrad mapping as that is the standard recording unit which was used from the 1970s until 2010, when monad recording was adopted. The monad map given below is therefore, except for a few Greater London records, restricted to data from 2010 onwards and gives a fuller understanding of the density of occurrence, with concentrations along the Medway Gap, along the parts of the Downs with a steeper escarpment and the chalk grassland along the eastern coastal cliffs.

***Carlina vulgaris* Kent records to 2024 mapped at monad level, from BSBI database**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Carline Thistle is normally a biennial, but may persist as a rosette, taking up to six years to flower. It spreads by seed which germinates in the spring. Eroded chalk slopes provide opportunities for this; otherwise, it is a poor competitor, and in closed turf is assisted by heavy grazing. It may struggle to find suitable habitat where ungrazed Tor-grass dominates East Kent chalk slopes, although it can be seen sparsely dotting such habitats. Open ground is provided by some less common habitats, such as consolidated shingle at Dungeness.

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[123] Henrys. P.A. *et al.* (2011). Impacts of nitrogen deposition on vascular plants in Britain: an analysis of two national observation networks. *Biogeosciences* **8**: 3501–3518.

Burham Downs. Photo by David Steere, 3 August 2014

Unlike the position in relation to many thistles, wind dispersal of fruits is not particularly effective: the plants are low, the fruits are relatively heavy and their pappus is easily detached. The fruits may also be susceptible to small mammal predation[124]. These factors point to a limited ability to spread beyond a local distribution and so it is at risk if its immediate habitat becomes unsuitable.

Carline Thistle is not readily confusable with other species in the British Isles.

Dungeness. Photo by Tim Inskipp

Dover cliffs. Photo by David Steere, 12 August 2017

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[124] Greig-Smith, J. & Sagar, G.R. 1981, Biological causes of local rarity in *Carlina vulgaris*. In (Synge, H., ed.) *The Biological Aspects of Rare Plant Conservation*.

Catabrosa aquatica (L.) P. Beauv. (Whorl-grass)

vc 15 and 16

Rarity / scarcity status

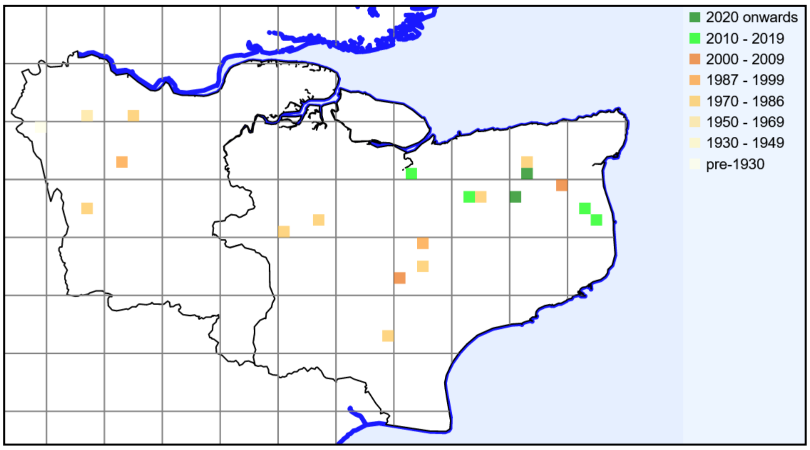
Whorl-grass is a creeping grass of wet areas widely, but patchily, distributed in the British Isles, but declining due to drainage works and the infilling of ponds. However, it is still sufficiently frequent that its conservation status in Great Britain is one of 'Least Concern', although in England the trend of decline has been sufficient to rank it as **Vulnerable** to extinction. In Kent its decline appears to have been largely pre-1970, and it currently ranks as very **scarce**. It is a Kent axiophyte, indicative of good habitat.

Northbourne. Photos by Sue Buckingham, 21 July 2011

Account

The first published record for *Catabrosa aquatica* in Kent is by Colin Milne and Alexander Gordon in vol. 1 of their *Indigenous Botany* (1793), the result of botanising in 1790-1793. It was then found "on the outer wall of the wharf, opposite *Norfolk College*, near *Greenwich*". Hanbury & Marshall (1899) regarded the species as common in ditches and muddy swamps, and found across the county. Francis Rose had records for it in 15 hectads (10km squares).

By the time of Philp (1982), it was reduced to nine widely scattered tetrad records, Eric Philp considering that it appeared to dislike modern farming methods, particularly chemical fertilisers. Philp (2010) recorded it in only seven tetrads – but these are all different ones from the previous survey, which is perhaps a pointer to the uncertainty of its occurrence. During the period 2020-24, we have recorded it in six tetrads (nine monads), all in East Kent. The last West Kent record was 1991-99, probably by the River Darent between Shoreham and Lullingstone.



***Catabrosa aquatica* Kent records to 2024 mapped at tetrad level, from BSBI database**

Catabrosa aquatica is in Kent a plant of muddy margins of ponds, ditches and shallow streams where water movement is slow, and the grass may form floating mats. It is succulent and susceptible to cattle grazing but may nevertheless be found in riverside grazing meadows. We have recorded an associated flora of *Helosciadium nodiflorum* (Fool's-water-cress), *Glyceria notata* (Plicate Sweet-grass), *Veronica anagallis-aquatica* (Blue Water-speedwell) and *Nasturtium officinale* agg. (Water-cress), all characteristic of wet marginal habitats

In a vegetative state, it may readily be mistaken for a *Glyceria* (Sweet-grass) species, which occupies similar habitats.

Little Stour, Preston, the greyish patch of grass by the near bank. Photo by Alex Lockton, 23 July 2023

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Brasted	TQ45S		After 1970, before 1981	Philp (1982)	TQ45S.
Shoreham - Lullingstone	TQ56G		1991-99	EGP (Philp, 2010)	TQ56G.
Sutton-at-Hone	TQ57K		After 1970, before 1981	Philp (1982)	TQ57K.
Chart Sutton	TQ85A		After 1970, before 1981	Philp (1982)	TQ85A.
Harrietsham	TQ85R		After 1970, before 1981	Philp (1982)	TQ85R.
Hamstreet	TQ93W		After 1970, before 1981	Philp (1982)	TQ93W.
South west of Hothfield	TQ9544		9 October 1991	CD	TQ 9584 4404, Great Stour river corridor survey.
Ashford	TR04B		21 July 2005	DG & EGP	TR04B.
South of Wye	TR04M		After 1970, before 1981	Philp (1982)	TR04M.
Bilting	TR04P		1991-99	EGP (Philp, 2010)	TR04P.
East of Faversham	TR0261		23 May 2017	LR	One small patch in a dyke at TR 03782 61779.
East of Faversham	TR0361		24 May 2017	LR	Two patches in a dyke within a solar farm, a large colony at TR 02973 61796 by a foot bridge and another smaller colony at TR 02985 61821.
Shalmsford Street	TR0854 and TR0955		August 1991	CD	TR 0896 5485 and TR 0918 5524, Great Stour river corridor survey.
Thanington	TR1256 and TR1357		(1) 16 June 2017 (2) 21 August 1991 (3) 20 August 1991	(1)GG (2) & (3) CD	(1) TR 134 572, in a ditch at Hambrook Marshes. (2) TR 1344 5705 and (3) TR 1297 5688, Great Stour river corridor survey.
Littlebourne	TR25D, includes TR2056, TR2057		(1) 23 July 2023 (2) 22 June 2023 (3) 1991-99	(1)SB & SL (2) SB (3) EGP	(1) raft of non-flowering plants in centre of the Nail Bourne river at TR 2096 5723.

				(Philp, 2020)	(2) Several plants flowering at margin of tributary of Little Stour at TR 20854 56979. This is a poached area in grazing meadow but found before the cattle had been put out. Also found at TR 2084 5678 in a similar situation. Associated species: *Helosciadium nodiflorum, Glyceria notata*, *Veronica anagallis-a*quatica and *Nasturtium officinale* agg. (2) TR25D
Wickhambreaux and Seaton	TR2258		October 1991	CD	TR 2213 5860 and TR 2256 5870, Little Stour river corridor survey.
Preston north west	TQ2361		23 July 2023	AL & JM	TR 2394 6112. A big patch on the edge of the Little Stour.
Ash Levels	TR25Z		(1) 14 June 2002 (2) After 1970, before 1981	(1) PHe & EGP (2) Philp (1982)	(1), (2) TR25Z.
Upstreet	TR26G		After 1970, before 1981	Philp (1982)	TR26G
Ham Fen	TR35H, includes TR3354	SSSI	(1) 1 August 2012 (2) 1 July 2002	(1) SB & LR (2) EGP (Philp, 2010)	(1) Dyke at TR 3347 5458. (2) TR35H.
Northbourne	TQ35L, includes TR3452, TR3453	SSSI	(1) 21 July 2011 (2) 1991-99 (3) 1982	(1) SB (2) EGP (Philp, 2010) (3) ACH	(1) Plants forming rafts on margins and in centre of North Stream from foot bridge at TR 34474 53248 to TR 34532 53000. Stream had been dredged in last 2 or 3 years. (2) TR35L. (3) TR 34743 52367, Hacklinge ditches survey.

Kent Rare Plant Register

Species accounts Part C (Ce-Cy)

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
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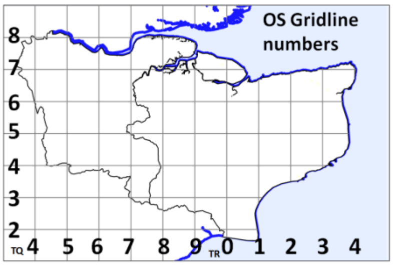
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AC Andrew Craven
AG Alfred Gay
AH A.C.B. Henderson
AL Alex Lockton
AS Alan Showler
BB Brian Banks
BBe Ben Benatt
BF Brian Ferry
BG Bob Gomes
BH B. Hawkes
BS Bob Scott
BW Brian Woodhams
CA C. Alanine
CH C.Harris
CJC & AP James Cadbury & A. Parker
CO Colin Osborne
CP Chris Pogson
CR Chris Rose
DC Danny Chesterman
DCh David Chambers
DG Doug Grant
DH Don Hardwick
DM Daphne Mills
DN David Nicolle
DW D. Worsfold
EB Enid Barrie
EGP Eric Philp
ES E. Scott
FB Fred Booth
FR Francis Rose
FRB F.R. Bryson
GB Bill Brook
GH Geoffrey Hall
GK Geoffrey Kitchener
JA Jan Armishaw
JC Juliet Cairns
JEL J.E. Lousley
JH J.Hendey
JL J.Lockward
JLo Jack Lowe
JM Joumana Mobarak
JLM J. Le Mesurier
JP Joyce Pitt
JRP John Palmer
JS Judith Shorter
KBRG Kent Botanical Recording Group
KFC Kent Field Club
L&DH Lorna & Derek Holland
LBB L. Breda Burt
LM Lesley Mason
LR Lliam Rooney
MA M. Austin
ME Michael Easterbrook
MG Margot Godfrey
MH Margaret Holdaway
MP Mike Porter
MPa Maureen Parry
MCS Mary Clare Sheahan
MW M. Waite
NH N. Holmes
NR N.Riddiford
NS Nick Stewart
OL Owen Leyshon
PB Peter Bassett
PG Phil Green
PH Peter Hodge
PHe Peter Heathcote
Pho P. Horton
RB R.A. Boniface
RC Ray Clarke
RD Dick David
RF Lady Rosemary FitzGerald
RG Bob Gomes
RM Richard Moyse
RMB Rodney Burton
RP R.D. Porley
RPe Robert Pennington
RS R.M.Stokes
RW R.H. Woodall
RWD R.W. David
SB Sue Buckingham
SC Steve Coates
SDA Stephanie D'Agorne
SK Sarah Kitchener
SL Stephen Lemon
SP Sue Poyser
TI Tim Inskipp
TS T. Swandale
WFS Wild Flower Society

Other abbreviations and references:

BBS British Bryological Society	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MNE = Maidstone Museum Herbarium	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
Hanbury & Marshall (1899) refers to their *Flora of Kent*	MOD Ministry of Defence	RNR roadside nature reserve

Centaurea calcitrapa L. (Red Star-thistle)

vc 15; gone from vc 16

Rarity / scarcity status

Centaurea calcitrapa is generally treated as an ancient introduction or archaeophyte in Great Britain (subject to differing views as regards possible native status, particularly in Sussex); but former sources of continued re-introduction such as with lucerne or clover seed, following improved seed-cleaning, no longer supply widespread casual occurrences. In Great Britain, the remaining populations are in Kent and Sussex, and it is regarded as **nationally rare** and **Endangered**, both in Great Britain as a whole and in England and it is treated as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006.

In Kent it appears to have been reduced to two sites, one of which appears currently (2020) unsuitable, and at the other of which it is hanging on with help (vital having regard to its significance in the national context), so it is accordingly **rare** in the county.

Darland Banks. Photo by Daphne Mills, 2011

Account

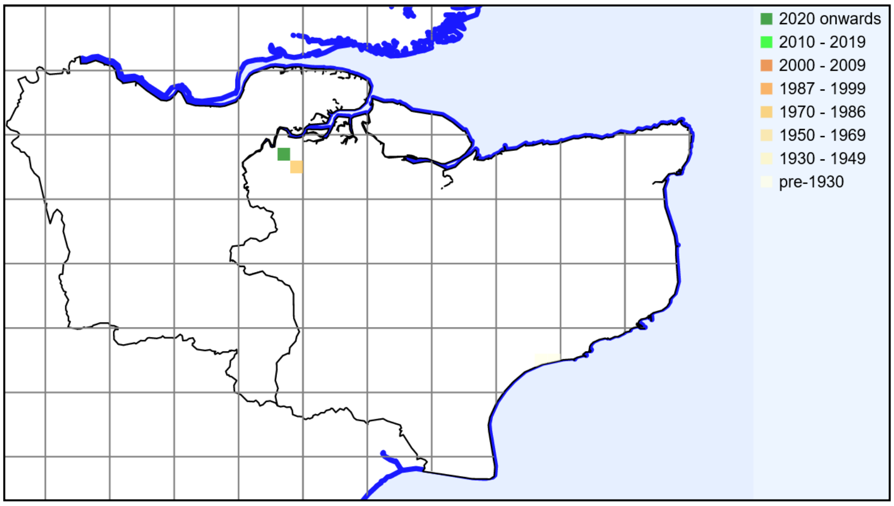
The first Kent records are by Thomas Johnson, on both of his botanical journeys in the county. On 15 July 1629, the species was encountered in travelling from Stoke to Cliffe via High Halstow and Cooling (*Iter Plantarum*, 1629); and on 2 August 1632 it was recorded at Thanet (*Descriptio Itineris*, 1632). These early dates are relevant to the issue of the Kent status of Red Star-thistle, whether native or introduced. If the source of introduction of the species is taken to be foreign seed of lucerne or clover - and Hanbury & Marshall (1899) mention an occurrence near Crockham Hill, perhaps introduced with foreign clover seed - then these first records appear unlikely to have such an origin, as they precede the general use of these crops. “Clover, lucerne and sainfoin had made their first tentative appearance in the 1620s-1630s, but they had commended themselves to only a few enthusiasts, mostly gentlemen concerned with fodder for their best horses...after 1660...clover was incorporated in the arable rotation and forged ahead...Lucerne, on the other hand, suffered from the belief that preparation of the soil for this crop was laborious, and only gentleman could afford it. Seed was usually bought it France in early days” (Joan Thirsk, 1997, *Alternative Agriculture: A History*).

Hanbury & Marshall (1899) assessed its Kent status as native or denizen, presumably on the basis that different occurrences were of different standing; and Marshall in the *Victoria History of the County of Kent* (1908) maintained that some *Centaurea* spp. had no claim to be native, “but *C. Calcitrapa*, L. is probably so on the coast”. Francis Rose described it in his manuscript *Flora of Kent* as ‘Probably native. Dry grasslands and banks on chalk near the Thames, Medway and Stour estuaries and in Thanet: rare, but still locally plentiful, though less frequent than formerly. It occurs in similar habitats near the Sussex coast and in the Somme estuary, and in these areas is probably native.’

Even supposing Red Star-thistle to have been a native in Kent, whether the most recent records are of native origin is not wholly determinable. A Wateringbury record (TQ65W) mentioned in Philp (1982), not included in the map and table below, was a clear non-native, being a wool alien (and as wool shoddy has not been spread on fields for many years, this is no longer a source of introduction). The Darland Banks chalk grassland site has a limited history (albeit at least back to 1938) and natural reproduction of the colony has been supplemented (and perhaps substituted) with cultivated plants from the same stock; its persistence is also assisted by Kent Wildlife Trust's control of competitive vegetation.

Chatham (Great Lines). Photo by Rosemary FitzGerald, 9 August 1985

The Chatham (Great Lines) site has (or had) the best recent Kent claim to potential native status (although not recognised as such by M. J. Wiggington (1999)[125]., with sightings at least back to 1839, when it was included in a list supplied to and published by M.H. Cowell as recorded "on the hill, and flds abt. C[hatham]" (*Floral Guide for East Kent*). However, part of the Great Lines site has been taken up by a nearby school and discontinuance of pony grazing latterly (possibly in the interests of tidying up the Great Lines Heritage Park) has reduced the disturbance needed by the species, and it has apparently ceased to occur here. The location (when checked by Sue Poyser and Doug Grant on 7 August 2020) had a thick grass sward in the absence of grazing, and is no longer suitable for the species.



***Centaurea calcitrapa* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Centaurea calcitrapa is a biennial of dry sandy or light chalky soils, on disturbed tracksides, banks or waste ground. Its seeds have no particular dispersal mechanism and are relatively heavy, so that they will drop near the parent plant and rely upon either erosion of slopes or subsequent disturbance to provide conditions for germination and establishment. In its recent Kent sites, this disturbance has been afforded by ponies, and removal of stock has had a deleterious effect on the Red Star-thistle. It seems possible that previous population fluctuations have related to changes in the pattern of disturbance. The species appears to have good viability in the seed bank, and has a reputation for return after absence.

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[125] M.J. Wiggington, *Centaurea calicitrapa* L. (Asteraceae) in (ed. M.J. Wiggington, 1999) *British Red Data Books 1 Vascular Plants*, JNCC.

Darland Banks. Photo by Daphne Mills, 2011

Site	Grid reference	Site status	Last record date	Recorder	Comments
Great Lines, Chatham	TQ7665		(1) 1992 (2) 1991 (3) 9 August 1985	(1) RM & FB (2) RM, FB & CH (3) RF	The site (TQ 766 675) has been searched in 2011 without success; the species is believed to have disappeared recently when pony grazing ceased. There had previously been continuity of records well back into the 19th century. A further check in 2012 (FB) revealed that the former main site (once a fenced-off pony-grazed area) had become covered with scrub, trees and dense vegetation. The adjoining rough pathway which also held a strong scattered colony had been replaced with a hard surface path. Another informal pathway has also been replaced. Edges of other informal pathways in the vicinity were checked but the Star-thistle could not be found. In 2020 the site was covered by a thick grass sward. (1) Eighty-one in two colonies (25 and 56). Serious decline from 1991. (2) 300+ plants seen. (3) A total of 73 plants, the majority in a rough field with ponies, in a trampled area along fence and scattered on chalk spoil mounds.
Darland Banks	TQ7766	KWT managed reserve, Access land	(1) 21 July 2023 (2) 23 July 2020 (3) 20 August 2015 (4) 7 September 2013 (5) August 2012 (6) 26 July 2011 (7) 1992 (8) 1991	(1) KBRG meeting (2) RPe (3) DH (4) CO (5)&(6) FB & DM (7) FB (8) FB, RM,	(1) Darland Banks, at TQ 77777 66590, at least 12 plants flowering. The plants were planted in 2022 from cultivated stock grown on from seed originating with Darland plants. They were in an area with rough grass and *Daucus carota*, the usual place. None were planted this year.

			(9) 1 August 1987 (10) 28 August 1938	CH. (9) RF (10) FRB	(2) TQ 7777 6658, twenty plus flower stalks in area where KWT does some work each year to ensure not swamped by brambles and grass. (3) Disturbed chalk grassland, eight plants, of which three sampled for Kew Millennium Seed Bank. (4) 14 plants, going over with last touches of green in leaves. (5) Three small patches, in area cut and cleared by KWT. (6) TQ 77785 66592, four strong patches c. 4 ft across, where FB saw it last several years ago. Has been told by KWT volunteer that plant has had some artificial support with re-introduction from garden-grown plants from original stock. (7) TQ 778 666; 36 plants (14 flowering) and 1 sq metre of seedlings. (8) TQ 778 666; several hundred plants. (9) About 12 mature plants plus some first year rosettes, on a grassy bank 50m from NW corner of the Banks (mown in September). (10).Near Star Mill Lane, Darland Banks (specimen in **MNE**).
Darland Banks	TQ7865	KWT managed reserve	1979	AH	Two plants on area grazed by tethered ponies.

Centaurea cyanus L. (Cornflower)

vc 15 and 16

Rarity / scarcity status

Cornflower was historically a widespread cornfield weed in the British Isles, an archaeophyte dating back to the Iron Age. It suffered a major decline in the twentieth century, probably due to the use of herbicides and improved seed cleaning, and became a British Red Data Book species, designated as endangered. Its current English and Great British conservation status is of 'Least Concern'. This is not because of any recovery of its former populations, but because its extensive occurrences as a garden escape or from sowings of wildflower seed mixes has made it difficult to distinguish between origin from old established cornfield populations and these recent casual or introduced occurrences.

It is uncommon in Kent, but falls just short of qualifying as rare or scarce in the county, so far as concerns populations less likely to have been introduced recently. Its inclusion in the rare plant register is due to its treatment as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006, albeit that in 2007 it was thought that only 34% of the 10km squares in which it was nationally recorded held "naturally occurring" populations.

Sarre. Photo by Lliam Rooney, 9 July 2010.

Account

Centaurea cyanus appears to be a late introduction in Britain, its archaeology being mediaeval, from around 1200 onwards[126]. Its seeds, and what appeared to be two flower-heads, have been identified with charred grain deposits associated with mediaeval (early 13th to late 14th centuries) baking and perhaps brewing, at Westwood, Thanet[127]. The first Kent botanical records are by Thomas Johnson, on both of his botanical journeys in the county. On 13 July 1629, the species was encountered in travelling after dinner by the main road from Gravesend to Rochester (*Iter Plantarum*, 1629); and on 2 August 1632 it was recorded at Thanet (*Descriptio Itineris*, 1632).

Bough Beech. Photo by Stephen Lemon, 14 July 2014

Although it is often thought of as a common arable weed in the past, Hanbury & Marshall's (1899) assessment was that "it can scarcely be called a common Kentish plant", although widespread and "not unfrequent" in fields, especially on the chalk. Thereafter, it is a story of decline with agricultural changes, so that in the 1971-80 survey published as Philp (1982), all records (11 tetrads in the administrative county) appeared to relate to escapes from cultivation, on rubbish-tips, roadsides and waste places. The position in Philp (2010) is broadly similar (12 tetrads[128]), but with recognition of some more traditional occurrences on deeply ploughed cornfields. Whilst Cornflower seed is often cited as having viability for at least four years, this may considerably understated. Evidence of the longevity of the seed-bank is afforded by the discovery in 1999 of *Centaurea cyanus* in the course of development of Kingshill, West Malling on a soil heap likely to represent the first disturbance since the 1930s of an area not under cultivation for over 100 years.

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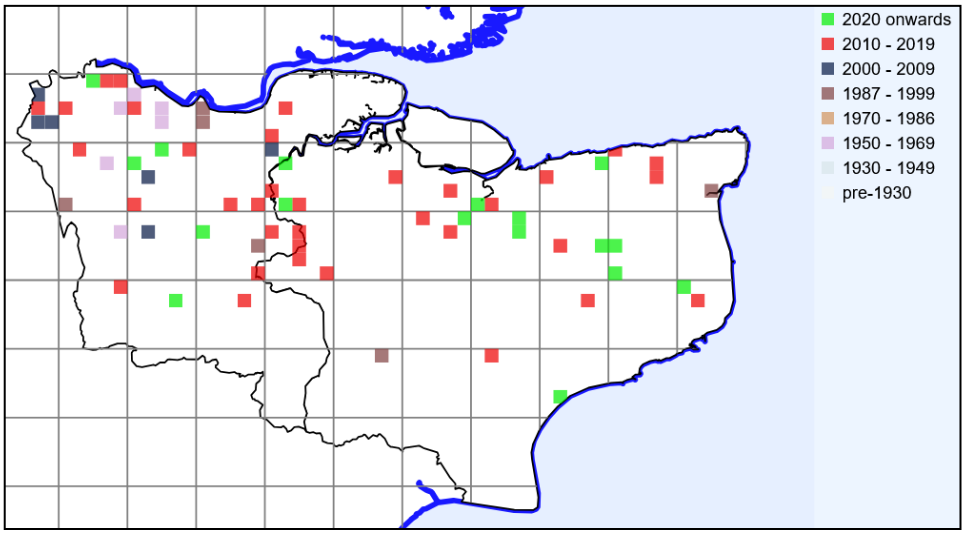
[126] Plant Atlas 2020 mentions its presence in Britain from the Iron Age onwards, but its principal association appears to have been with the cultivation of rye which, while undertaken in Anglo-Saxon times (the laws of Wihtred, king of Kent, dated 695, refer to the month of Rugern, rye-harvest), is considered to have been at its most intensive in Europe in the high Middle Ages, according to Behre, K-E. (1992) The history of rye cultivation in Europe, *Vegetation History and Archaeobotany* **1**: 141-156.

[127] Powell, A.B. (n.d.) Baking and brewing in a mediaeval settlement at Star Lane, Westwood, Thanet. Wessex Archaeology.

Cornflower is an annual and thought to be largely autumn-germinating, in which case it is best suited to an arable cultivation regime involving autumn-sown crops. There is no known Kent arable population which is long-persistent. Even the occurrence of arable margin plants needs to be considered with caution, as more likely to represent deliberate sowing than origin from an historic seed-bank.

Bough Beech. Photo by Stephen Lemon, 14 July 2014

One of the most convincing recent sightings was in 2014, in an autumn-sown wheat-field near Bough Beech, where ten plants were found by Stephen Lemon (plus one picked specimen found lying on the ground). Pointers to non-introduced status were the random scatter of plants in the field, not confined to the edges, and the absence of any white-flowered variants. The farmer had not sown the plants and indeed had been unaware of them; he had omitted herbicidal treatment through lack of time, which accordingly had provided an opportunity for the Cornflower to appear.



***Centaurea cyanus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The accompanying distribution map is not particularly meaningful other than, through the concentration of urban records, confirming their introduced origin.

The following table does not include all recent records. Those which appear to have been obvious introductions or their progeny are omitted.

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[128] TQ56H, TQ65X, TQ66V, TQ67B, TQ67C, TQ75D, TQ75E, TQ76E, TQ83U, TR05U, TR26S, TR36L.

Site	Grid reference	Site status	Last record date	Recorder	Comments
East of Bough Beech reservoir	TQ4948, TQ4949		14-16 July 2014	SL	On 14 July, nine plants were seen in flower, singles spread out randomly throughout a wheat crop, not confined to the edges of the field or obviously favouring the weedier areas, although they were easier to spot where the crop was less dominating: TQ 49142 48811, TQ 49198 48785, TQ 49185 48754, TQ 49061 48735, TQ 49061 48741, TQ 49048 48713, TQ 49042 48709, TQ 49043 48703 and TQ 49031 48697. The farmer confirmed he had not sown it and was not aware the species was there, the wheat was sown last Autumn. He did not spray the field with herbicide as he left it too late to do so. On 16 July, a further plant was seen by SL with PB, this one at the most northerly point of the field, TQ49131 49015, so extending the range of discovered occurrence and providing further evidence of seed-bank origin.
Trottiscliffe	TQ6460		4 June 2011	L&DH	A large plant in flower at the edge of the cornfield (Pinesfield Lane, TQ 64871 60710).
Whetsted	TQ6646		1 June 2019	GK	TQ 6664 4655 to TQ 6668 4656 west of A228, in tall *Lolium perenne* ley, presumably former arable, c.22 scattered plants. Origin not obvious, but potential for seed-bank origin. Public footpath at west end of field, but plants away from this.
West Malling airfield (now Kingshill).	TQ6854	Developed site	1999	FB & EGP	On bank of top-soil, and likely to be a product of the first soil disturbance here at least since the 1930s, with cultivation not having taken place for over 100 years. *Agrostemma githago* and *Hyoscyamus niger* also present.
Higham	TQ7171		26 May 2014	SP & DG	Two plants in edge of rape field, Hermitage Road.
Bluebell Hill	TQ7560		22 September 2016	SP & DG	In grass ley at bottom of Bluebell Hill, not recently sown so far as recorders aware.
Bridge	TR1954		14 June 2021	JLo	Single plant at arable field margin next to road at TR 1990 5447
Kingston	TR2051		2 July 2022	JLo	At least five flowering plants on both sides of PROW, among many other wild flower species in arable reversion meadow established on field at TR 2012 5144.
Belttringe	TR2068		16 June 2018	CO	Single plant on cliff, no bird seed or alien plants nearby.
Adisham	TR2154		23 June 2023	JLo	TR 21452 54159: One flowering plant on north side of PROW close to trig point, on edge of crop field.
Sarre	TR2665		9 July 2010	JA	TR26127 65526: extensive patches along one side of cornfield nearest road.

Cephalanthera damasonium (Mill.) Druce (White Helleborine)

vc 15 and 16

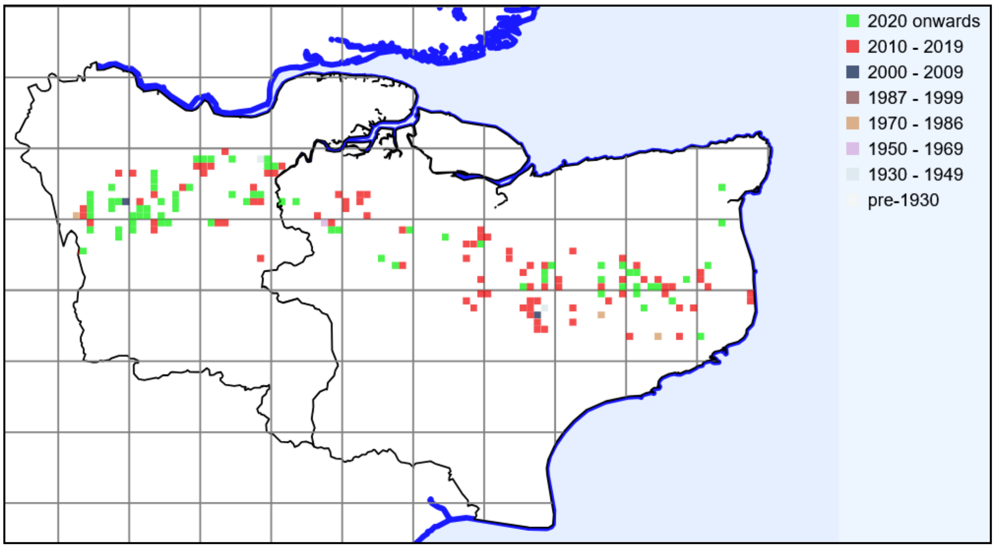
Rarity / scarcity status

In the British Isles, White Helleborine is restricted to southern England, excluding the west; and there has been a marked trend of losses, perhaps related to clearance of its woodland habitats, which gives rise to its status as **Vulnerabl**e, both in relation to England and to Great Britain as a whole. In Kent, the species is not uncommon in beech woods on chalk; it may be increasing, and does not warrant designation for local rarity or scarcity. However, it is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006 and as a Kent axiophyte it is regarded as an indicator of good habitat.

Fridhill Wood. Photo by Lliam Rooney, 2 June 2010

Account

The first mention of *Cephalanthera damasonium* in Kent is in a letter of 1671 from Sir Philip Skippon to John Ray, in which he states that Thomas Willisell “hath discovered *Helleborine flo. albo* to grow a Mile on this Side *Green-Hithe*, in a Valley near a Church”[129]. Hanbury & Marshall (1899) regarded it as locally abundant in woods on or near the chalk, usually under beeches: frequent along the North Downs, but not found in metropolitan west Kent, or in northernmost Kent east of the Medway. This broadly remained the case when assessed by Francis Rose in the 1940s-60s. Whilst it was often abundant under beeches on chalk, it was also frequent, but not abundant, in coppice and scrub on chalk. Rarely, it had also been recorded on ragstone (Broadhoath Wood, Stone Street, 1950) or gault clay (Ryarsh Wood, 1942-43; Cadmans Wood, Brook, 1946). The breadth of its Kent occurrence was still shown by the 1971-80 survey of Philp (1982), when 84 tetrad records were made in the administrative county, spread across it in a band following the presence of chalk.



Cephalanthera damasonium **Kent records to 2024 mapped at monad level, from BSBI database.**

Given that the survey of 1991-2005 (Philp, 2010) produced only 45 tetrad records, the question arises as to whether this is a product of the decline which, nationally, is reflected in the species’ Vulnerable status, or whether this is an artifact of different recording methods or input. In general, orchid recording appears to be more responsive to networked or crowd-sourced survey, rather than solo efforts (as with Philp, 2010). Our 2010-24 records replicate well the distribution pattern shown by those of 1991-2005, following the chalk across the county, but are considerably more extensive, including many sites not featuring in the earlier survey. They relate to 111 tetrads (160 monads). These data therefore do not support the decline which a comparison of the Philp (1982) and Philp (2010) surveys appears to indicate.

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[129] ed. W.Derham (1718). *Philosophical letters between the late learned Mr. Ray and several of his ingenious correspondents, natives and foreigners* p96.

Cephalanthera damasonium is a plant generally of shady woods and banks, especially beechwoods on chalk where there is little ground cover and the plant may be found growing on bare dry soil or in leaf litter. Spread may be by rhizomes and seed production is, in the dense shade, likely to be normally by self-pollination. It has also been seen in Kent under yew and hornbeam, both also providing densely shaded habitat, and in developing scrub on chalky slopes, where shading is lighter. Exceptionally, it has been seen on bark chippings in an amenity planting of a car park near Sandwich; there is definitely an ability to act as a colonist when appropriate habitat develops, presumably with mycorrhizal presence. However, although *Cephalanthera damsonium* has a number of fungal associates, it appears that *Tomentella* taxa, in particular, detected in tree ectomycorrhiza in Hampshire, support its germination, seedling development and subsequent growth[130].

Most reported colonies in Kent are of small numbers, or up to 100 spikes; but there are larger ones - at Fridhill Wood near Perrywood (TR0354 to TR0355) in 2010 the quantity reported was in tens of thousands. It has been seen in the company of various other orchids: *Dactylorhiza fuchsii* (Common Spotted-orchid), *Neottia nidus-avis* (Bird's-nest Orchid), *Ophrys apifera* (Bee Orchid), *Ophrys insectifera* (Fly Orchid), and *Orchis purpurea* (Lady Orchid).

Fridhill Wood. Photo by Lliam Rooney, 2 June 2010

Bredhurst. Photo by Stephen Lemon, 9 June 2012

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[130] Bidartondo, M. & Read, D. (2008). Fungal specificity bottlenecks during orchid germination and development. *Molecular Ecology* **17**: 3707–3716.

Cerastium arvense L. Field Mouse-ear)

vc 15 and 16

Rarity / scarcity status

Field Mouse-ear is widely distributed in dry grassland across the British Isles, although much less common in the west. In Great Britain as a whole it is not treated as at risk, its conservation status being regarded as of 'Least Concern'. However, a comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 20% in the likelihood of recording the species. This just reaches the threshold for designation as **Near Threatened**, and so approaches qualification status for a level of risk of extinction in the wild. In Kent, Field Mouse-ear is neither rare nor scarce, although this is a reflection of its status in East Kent, as there is very little in West Kent. The level of decline reflected in a comparison between the county surveys of 1971-1980 and 1991-2005 is 63% which, if replicated in national terms, would have resulted in a much higher risk rating. It is a Kent axiophyte, and so indicative of good habitat.

Sheldwich. Photo by Lliam Rooney, 26 May 2012

Account

The first record of Field Mouse-ear in Kent was noted by Hanbury & Marshall (1899) as inscribed by James Newton c.1680 in the margins of a copy of a botanical publication, although there appears to be some confusion as regards the book's identity[131]. The annotation is recorded as 'Caryophyllus Holostius … in a close wherein is much Caput Gallinaceum [*Onobrychis sativa*, per Hanbury and Marshall = *Onobrychis viciifolia*], near a little house at y^{e} foot of a descent ab^{t} a mile or two from Dartford, a little on y^{e} Greenstreet, y^{e} way to Southfleet, Kent. This is not far from where it may be found today, north west of Longfield. An alternative first record is Johnson's reference to Alsine hirsuta major (interpreted by Francis Rose as probably *Cerastium arvense*) in his *Iter Plantarum* (1629), seen between Gravesend and Rochester (which Francis Rose noted, 1972, as still growing on Johnson's route). However, apart from a sprinkling of records in north west Kent, and a rather surprising reference to the species as being not uncommon in cornfields in Thomas Forster's *Flora Tonbrigensis* (1816), the species appears to have been primarily an East Kent plant, both historically and now. Hanbury & Marshall (1899) refer to *Cerastium arvense* as being frequent, but local, on fields and banks, chiefly on the chalk. Such chalky areas included Chartham Downs, Thanet, the Dover area and Barham Downs (being found in profusion at this last locality by William Pamplin in 1824[132]).

Longfield. Photo by David Steere, 11 April 2021

In contrast, it was recorded on sandy hills between Boughton and Dunkirk, and presumably sandy ground by the Hothfield Green workhouse. This duality of habitat was also acknowledged in Philp (1982), in which Field Mouse-ear was said to be frequent in the east of the county, rather scarce elsewhere, on roadside banks and rough grassland on both chalk and sandy soils. It was during the period 1971-80 recorded in 48 tetrads. The reduction to 18 tetrads in Philp (2010) for the period 1991-2005 is dramatic, but without obvious explanation. It is, however, possible that the species' reliance on well-drained soil, coupled with its predominantly eastern UK distribution, reflects some sensitivity to the amount of precipitation, and so Field

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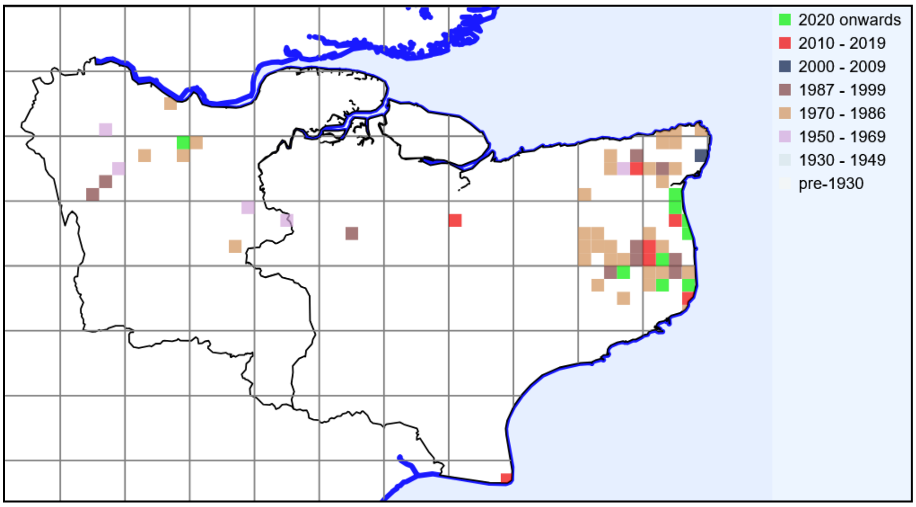
[131] The book in question is given in Hanbury and Marshall's list of source material as John Parkinson's *Theatrum Botanicum.* However, in the Historical Summary of the *Flora of Kent* (1899), Newton is stated to have made many notes of Kentish plants in a copy of the second edition of John Ray's *Synopsis Methodica Stirpium Britannicarum.*

[132] Given by H.C. Watson from a manuscript source in *The New Botanist's Guide* (1835) vol. 1, with location corrected in vol. 2.

Mouse-ear may be affected by increases in winter rainfall. Plant Atlas 2020, however, refers to the potential of adverse effects from atmospheric nitrogen deposition[133].

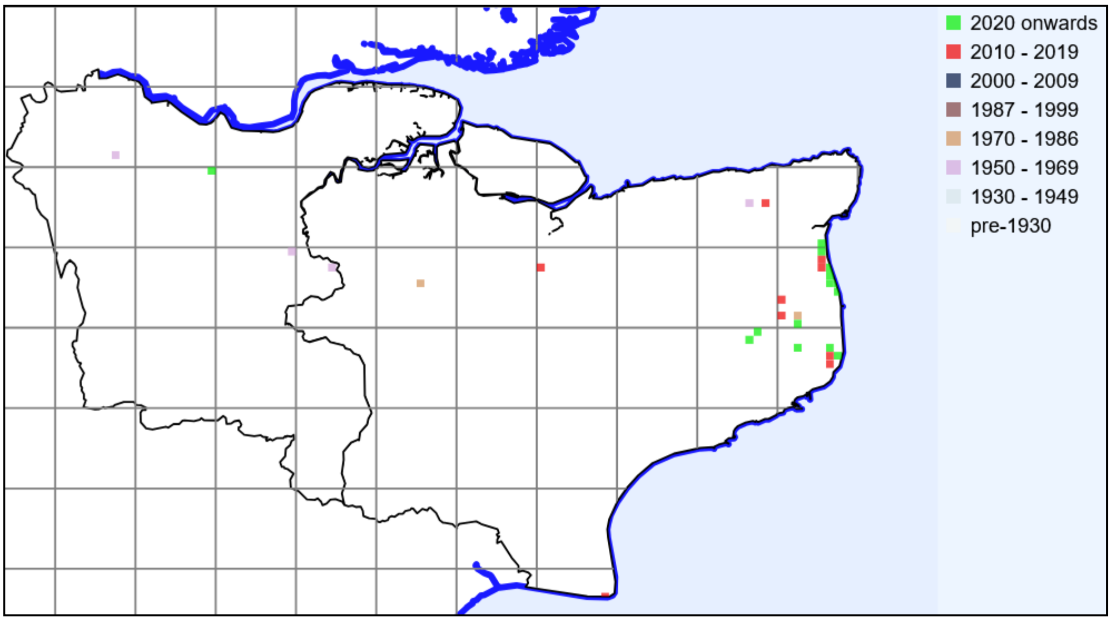
Our 2010-24 records mostly fall within the distribution pattern shown by those of 1991-2005, but have not yet replicated all of the earlier locations and cover only 16 tetrads (23 monads), so it looks as though there is continuing and substantial decline, amounting to 71% since the 1970s, and that Field Mouse-ear is becoming a more coastal plant.



***Cerastium arvense* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The 2010-24 sightings include habitats such as golf courses, roadside banks, chalk grassland (often associated with coastal areas including cliff-top), dune grassland and a chalk pit. These records are given below at higher resolution, with older records largely unrepresented because generally made 1970-2010 at tetrad level.

***Cerastium arvense* Kent records to 2024 mapped at monad level, from BSBI database.**



Cerastium arvense is a perennial with a scrambling habit, and might be taken as having some resemblance to *Stellaria holostea* (Greater Stitchwort), which occupies similar road-bank habitats, but has more divided petals than *Cerastium arvense* and is almost hairless rather than downy.

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[133] Cf. Henrys, P.A. *et al.* (2011) Impacts of nitrogen deposition on vascular plants in Britain: an analysis of two national observation networks. *Biogeosciences* **8**: 3501–3518, although this paper treats *Cerastium arvense* in the context of lowland acid grassland, which is not its usual Kentish habitat.

Field Mouse-ear hybridises with the garden escape *Cerastium tomentosum* (Snow-in-summer), and this cross has been recorded at Sandwich Bay (TR35T, by J.E. Lousley) and at Acol, where it has been present for several decades and was still in 2013 found (by Lliam Rooney) to be well established on the northern verge of the A28 Canterbury Road from TR 29002 67740 to TR 29016 67742. In addition, there are plants found in 2012 by Tim Inskipp near the old lighthouse at Dungeness, differing from nearby *Cerastium tomentosum*, and which also seem to be hybrids. Furthermore, Sue Buckingham investigated in 2017 two sites near Shepherdswell from which it appears that Philp (2010) gave *C. arvense*. In both cases the species could no longer be found, but had been supplanted by the hybrid. Plants had a mixture of types of indumentum from the parents: long crinkled white hairs, shorter straight hairs and a scattering of short glandular ones. The cross was also recorded at Sandwich (2018 and 2020), Walmer (2020) and East Studdal (2023).

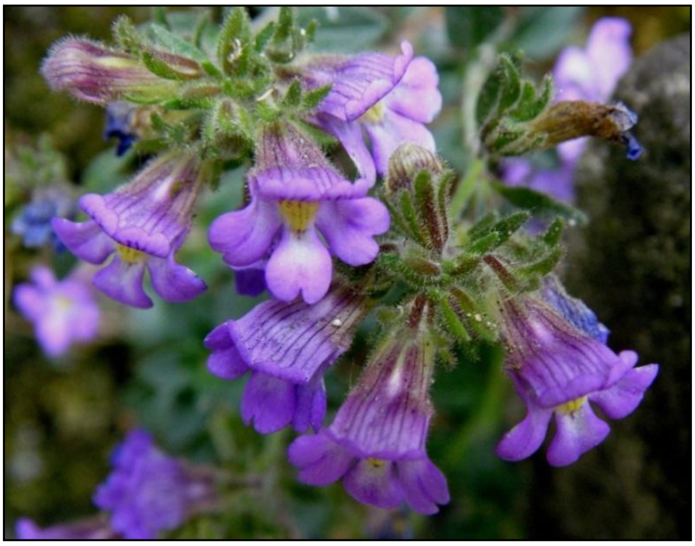
Sheldwich. Photo by Lliam Rooney, 26 May 2012

Chaenorhinum origanifolium (L.) Kostel. (Malling Toadflax)

vc 15 and 16

Rarity / scarcity status

Chaenorhinum origanifolium does not enjoy any national conservation status, nor was it included in initial listings of plants for the Kent Rare Plant Register. This is because it is neither a native plant nor an ancient introduction. Guidelines for preparation of county registers, however, permit the inclusion of long-established non-native plants which have particular cultural, historical or ecological interest. On this basis, *Chaenorhinum origanifolium* qualifies for inclusion as a **Kent heritage plant**, as its probable first introduction to the British Isles was at West Malling; this location has supplied the only long-standing permanent population in the country; and its usual English name of Malling Toadflax reflects this close connection with Kent. It is probably rare nationally (given that some of its recent records will have been casual) and it is **rare** in Kent.



West Malling. Photo by Lorna Holland, 2011

Account

The Malling Toadflax is a native of south west Europe. Hanbury & Marshall (1899) noted it as having been collected from a wall at West Malling by F. Shrivell, a Hadlow chemist whose specimen became included in the herbarium of the (then) Pharmaceutical Society of Great Britain. This is likely to be represented by a herbarium sheet now in **BM** and labelled May 1877 near West Malling, Kent and initialled FWES, matching his handwriting elsewhere. It is the first record for Kent (and the British Isles). C.H. Fielding in 1893[134] referred to it as found growing luxuriantly on the walls of the old Abbey at Malling and identified by Professor Holmes of the Pharmaceutical Society. By 1943, according to Francis Rose, it was still frequent on several walls at West Malling and was reputed to have been introduced by the monks of Malling Abbey[135]. This last supposition can scarcely be accurate. Until the Dissolution (when the Abbey was secularised), and then from 1892, the Abbey's religious communities have been nuns rather than monks; and it is more likely that the plant was introduced at some time after the mid-eighteenth century when the property was rebuilt as a neo-gothic mansion - it was clearly present before religious use was resumed.

It is still (2012 – surveyed on different occasions by JA, LR and GK; and in 2016 by Brian Woodhams) present on the top and street side of the ragstone Abbey walls in Swan Street (TQ 682 577) opposite Abbey Brewery House; as well as growing on brick walls at an Abbey entrance onto Lavenders Road (TQ 68349 57652); on a low brick wall outside Abbey Brewery Court; on the northern side of Swan Street on top of a ragstone wall nearly opposite the Lavenders Road junction; on the side of a ragstone wall of Went House at the junction of Swan Street and Frog Lane (TQ 68321 57732); and on two ragstone walls further down Frog Lane. On wall sides it may be susceptible to extensive re-pointing of mortar – it has apparently gone from walling on the west side of Frog Lane in consequence. The seed is capable of spreading to inaccessibly high wall-tops and has apparently even reached the parapet roof of Went House (the furthermost building in the habitat photograph below - not visible from ground level).

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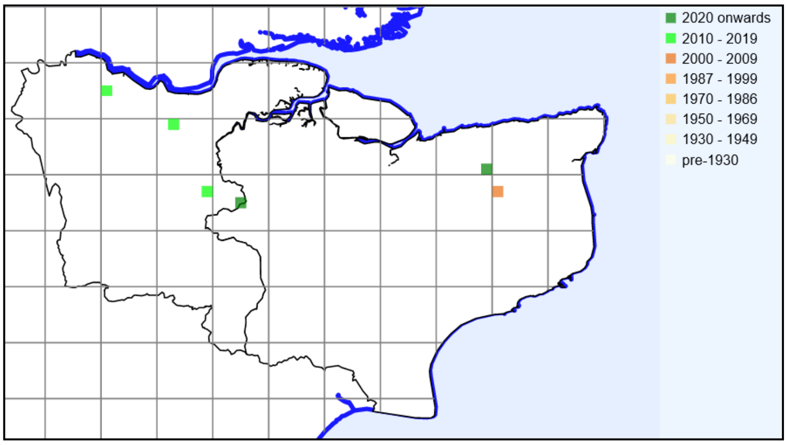
[134] *Memories of Malling and its valley; with a flora and fauna of Kent*.

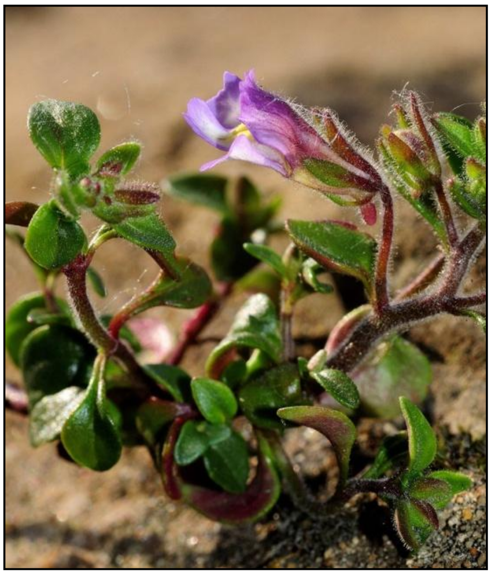
[135] *BEC Report for 1945* (1947), 13:32.



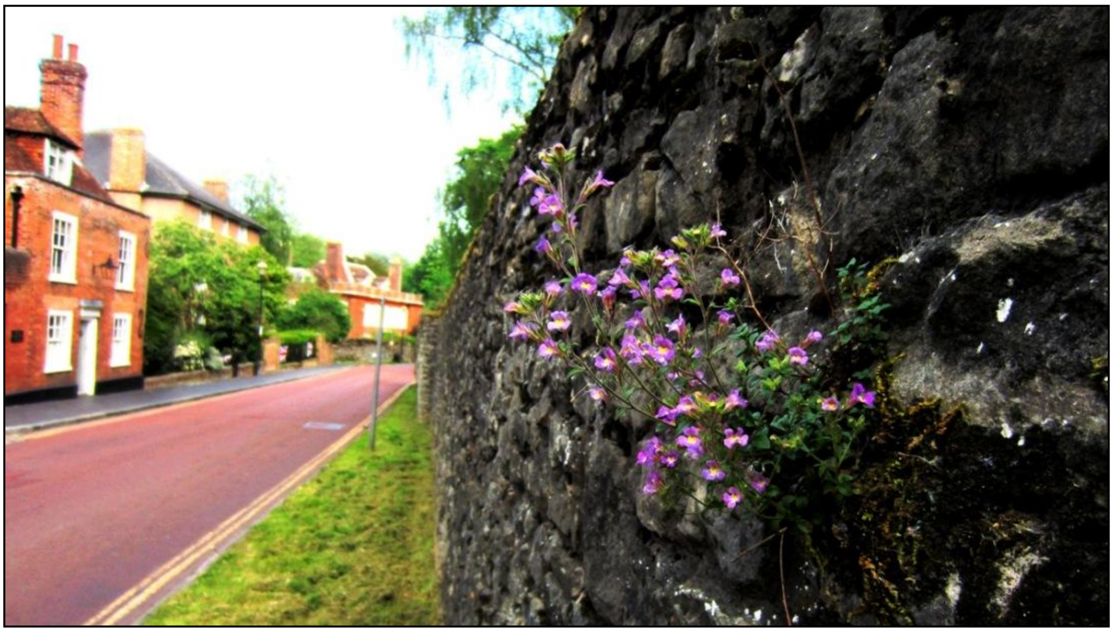
Chaenorhinum origanifolium **Kent records to 2024 mapped at tetrad level, from BSBI database.**

The only other Kent records appear to have been a sighting on an old wall at Littlebourne (TR25D) on 2 May 2002 (Eric Philp and Doug Grant); on the outside wall of Hall Place gardens, Bexley, near the entrance (recorded by Rodney Burton as established, 15 June 2014, TQ5074; on garden walls at Arcadia Road, Istead Rise (noted by Rodney Burton on 18 August 2016, TQ6369); and in Maidstone pavement cracks (3 May 2022, Brian Woodhams, TQ7555). Also, it was reported (1 June 2018, by Diana Poulton) as well naturalised along about 20 feet of the listed brick wall constituting the southern boundary of Westbere churchyard, TR 1923 6106 (still present, 2022, albeit suffering from the hot summer that year).

In its native Spain it may be found on calcareous rocks and on walls. These preferences are also reflected in its growth in the mortar of ragstone walls at West Malling.



West Malling. Photo by Lliam Rooney, 13 May 2012



Abbey walls, Swan Street, West Malling. Photo by Geoffrey Kitchener, 3 June 2012

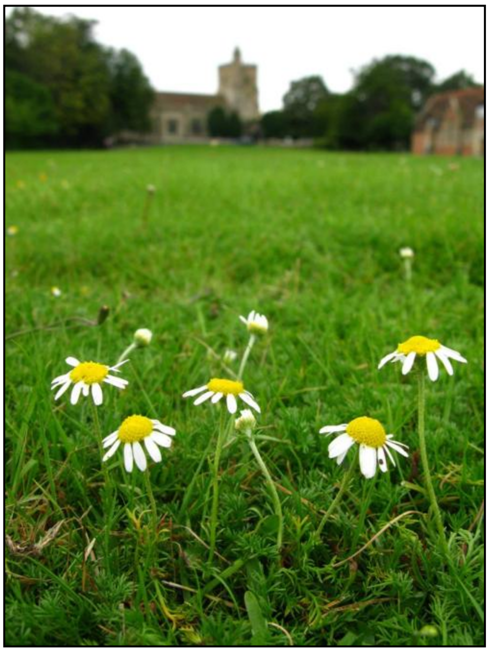
Chamaemelum nobile (L.) All. (Chamomile)

vc 15 and 16

Rarity / scarcity status

Chamomile is locally frequent in southern England and south west Ireland. Historically it was more widespread in central Britain and East Anglia, but many losses have occurred; and, although populations remain stable in the core areas, the potential for further loss has led to it being regarded as a **Vulnerable** species both in Great Britain and in England. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006, threatened by eutrophication, drainage and cessation of grazing on village greens and lowland acid grasslands. In Kent, it appears (other than as a casual) to have been reduced to three sites and is **rare**.

Southborough Common. Photo by Geoffrey Kitchener, 13 September 2012.



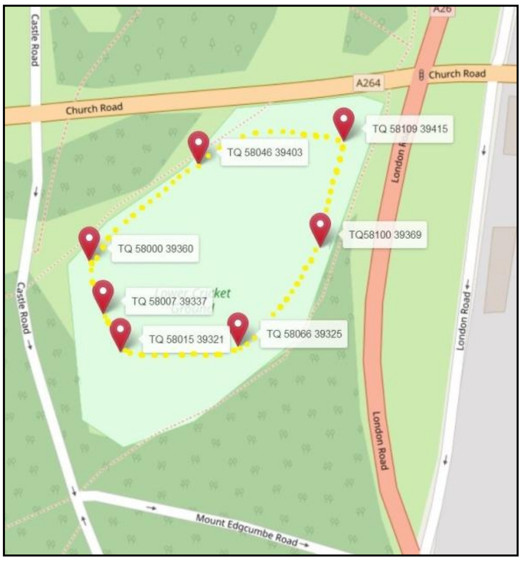
Benenden village green. Photo by Sue Buckingham 15 August 2012

Account

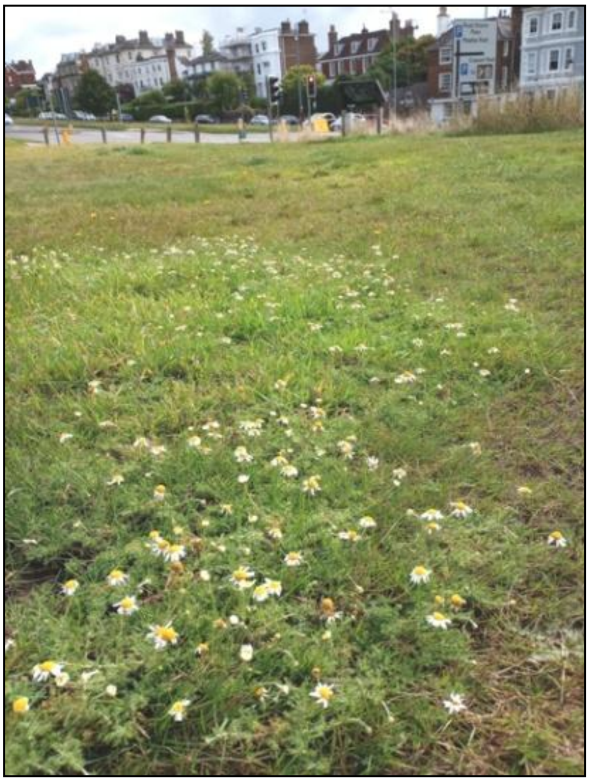
The first mention of *Chamaemelum nobile* wild in Kent is in Edward Jacob's *Plantae Favershamienses* (1777), where he refers to the Sweet-scented Camomile as uncommon on Charing Heath. Hanbury & Marshall (1899) considered it rather rare, to be found in short turf, on village greens, heaths, etc. and Marshall (in the Victoria History of the County of Kent, 1908) referred to the species as abundant in the Tunbridge Wells neighbourhood, but scarce elsewhere. Francis Rose similarly noted it in the Tunbridge Wells area, but (1950s/60s) 'now very rare; formerly more frequent, but exterminated by enclosures, lack of grazing, and re-seeding of commons in several places'.

In that neighbourhood, Chamomile has been known from Rusthall, Tunbridge Wells and Southborough Commons. Philp (1982) cited it as still present in the latter two locations, but by the time of the survey published as Philp (2010), it could only be located at Southborough Common (plus a casual East Kent occurrence). This then appeared to be the sole surviving site from Hanbury and Marshall's time: a public open space of unimproved acid grassland where the turf is kept short by mowing.

However, it seems that Chamomile was not lost from the other commons after all, at least so far as concerns Tunbridge Wells Common. Virtually no mowing is undertaken at Rusthall other than on the cricket pitch, and limited mowing is carried out at Tunbridge Wells Common. Both have much more tree cover than was the case up to the nineteenth century, when they were open grazed areas with suitable terrain for Chamomile, the first major tree planting at Tunbridge Wells Common having been commenced in 1867, with natural colonisation by birch and other species following on from the decline in grazing. The most consistently mown areas at Tunbridge Wells Common are those used for sporting activities, and it is at one of these locations (the lower cricket ground) that Chamomile was re-found in 2012, with many patches over c. 40 x 15 metres of level *Agrostis capillaris* (Common Bent) grassland which was then laid out as a children's running track. In 2023 the temporary cessation of mowing had enabled plentiful flowering in August, and numerous flowering patches were seen within an area of at least 5,000 square metres (see map).


Castle Road
A26
Church Road
A264
Church Road
TQ 58109 39415
TQ 58046 39403
TQ 58000 39360
TQ58100 39369
TQ 58007 39337
TQ 58015 39321
TQ 58066 39325
London Road
Castle Road
London Road
Mount Edgcumbe Road

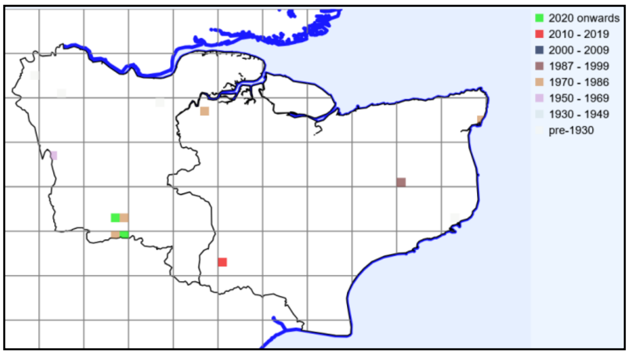
***Chamaemelum nobile* at Tunbridge Wells Common, 2023, maximum extent shown by broken yellow boundary. Map: copyright OpenStreetMap and its contributors, made available under the Open Database Licence http://opendatacommons.org/licenses/odbl/1.0/.**



Tunbridge Wells Common. Photo by Geoffrey Kitchener, 3 August 2023

Chamaemelum nobile is still also present at Benenden, discovered in 2012, where the village green turf is maintained by mowing.

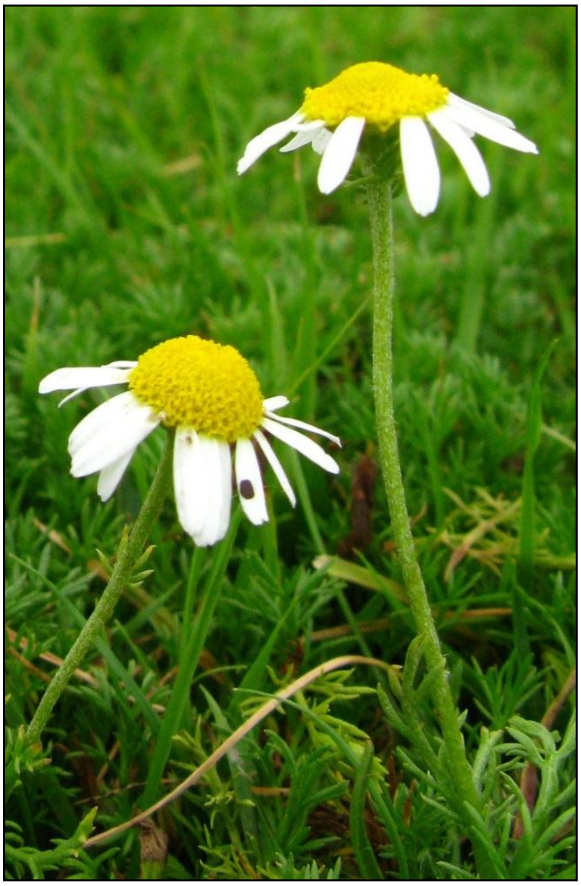
Chamomile is a plant which cannot tolerate shading and competition from taller plants, and so is reliant upon a regime which controls this, generally by grazing or mowing. It favours seasonally wet ground, which may be provided by impeded winter drainage through summer baking of sandy soil. It is a long-lived perennial which can spread out tightly over the ground in response to close grazing or mowing.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

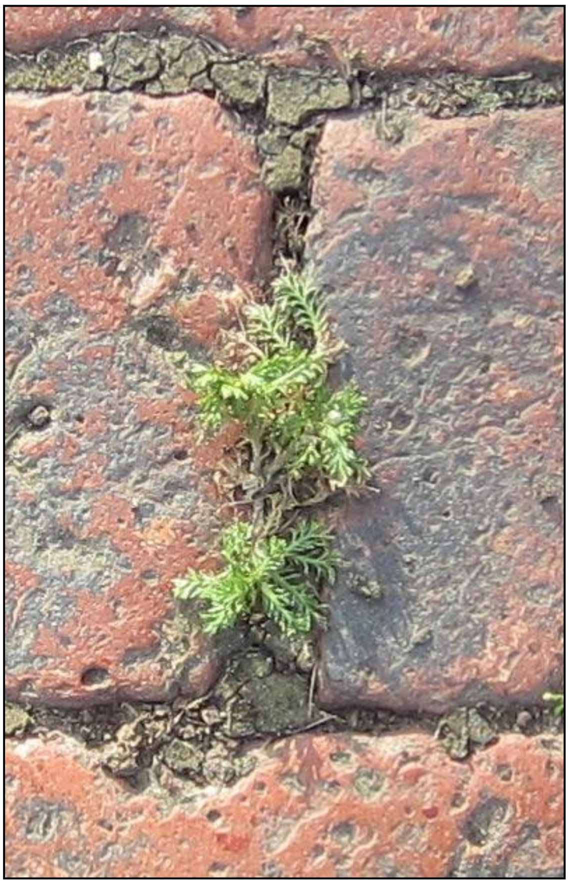
***Chamaemelum nobile* Kent records to 2023 mapped at tetrad level, from BSBI database.**

It is a species which may feature in wildflower mixes, which opens potential for random occurrences, e.g. the KWT has apparently been party to its use in 2015 in a seed mix intended to convert arable to a floodplain meadow at Somerden Farm, Chiddingstone.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Tunbridge Wells Common	TQ53U	Common land managed by conservators.	(1) 3 August 2023 (2) 4 October 2012 (3) After 1970, before 1981	(1) & (2) GK (3) Philp, 1982	(1) Abundant in flat grassland (lower cricket ground) on common, numerous flowering patches over an area enclosed by gridpoints TQ 58109 39415, TQ 58046 39403, TQ 58000 39360, TQ 58007 39337, TQ 58015 39321, TQ 58066 39325, TQ58100 39369. Sward low, not mown very recently, giving plants a chance to flower. (2) TQ 5803 3936; many patches in area of c.40 x 15metres of mown *Agrostis capillaris* grassland, of level, open aspect and used for sporting activities. (3) c. TQ 581 390. Not found at this grid reference in September 2012. There is an 1882 specimen (H. Lamb) from the common in **MNE**.
Southborough Common	TQ5742	Common land owned by Southborough Town Council	(1) 1 April 2024 (2) 8 August 2021 (3) 10 November 2019 (4) 3 June 2017 (5) 14 September 2012 (6) After 1990, before 2006	(1), (2), (3) & (4) SL (5) GK (6) Philp, 2010	(1) Southborough Common, mown turf immediately south of cricket pitch, TQ 5760 4280. Strong patches in leaf, either side of brick path. (2) Southborough Common, north side of Victoria Road, TQ 5770 4265. Metre patch flowering and smaller patch close by, in rank grassland along path at the foot of the open heathy grassland. About 150 metres south of the main colony by the Cricket Pitch. (3) Southborough Common, south of path and edge of the cricket pitch, opposite church, TQ 5760 4280. Showing well in leaf and some fairly tall flowers benefiting from the lack of mowing. (4) Lawn on opposite side of road to St. Peter's Church and south of cricket pitch, TQ 5758 4278. (5) TQ 57600 42803, extensive patches in area of 20 x 6 metres of mown turf on south-facing slope below brick path running across common from church. Also occasional plants on the bricks. (5) TQ54R. Recorded here in 1946 by FR.
Chatham	TQ7667		1971	Philp, 1982	Roadside verge.
Benenden	TQ8032		15 August 2012	SB	Large patches on village green at TQ 8088 3281, covering some 20 x 30m, south side of cricket pitch, discovered by LR on 1 February 2012.
Barham	TR2150		1993	EGP	Casual plants on a roadside verge.
Ramsgate	TR3965		1971	Philp, 1982	



Benenden village green. Photo by Sue Buckingham, 15 August 2012



Brick path at Southborough Common.
Photo by Geoffrey Kitchener, 13 September 2012

Chenopodiastrum murale (L.) S Fuentes, Uotila & Borsch (*Chenopodium murale* L.) (Nettle-leaved Goosefoot)

vc 15 and 16

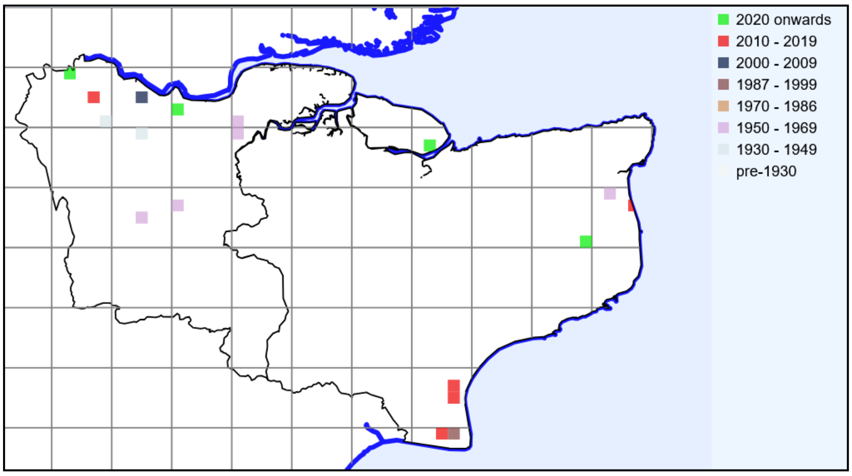
Rarity / scarcity status

Nettle-leaved Goosefoot has been widespread as an archaeophyte, or ancient introduction, in England, less so in Wales and very local in Scotland and Ireland. It has, however, markedly declined at least since the 1960s, and is now treated as **Endangered** in both Great Britain as a whole and England, although there are data interpretation issues because of the difficulty in distinguishing casual occurrences from permanent populations. In Kent it has been little seen in recent times; based on the account in Philp (2010) it would be treated as rare, but is better regarded as **scarce**.

Lydd. Photo by Owen Leyshon, 8 September 2013

Account

The first published record for Kent is by Edward Jacob in his *Plantae Favershamienses* (1777), where he refers to it as "*In Gardens and on Rubbish – not uncommon*". Hanbury and Marshall (1899) described it as to be found on "waste or cultivated ground: local, though not uncommon on the coast". Philp (1982) referred to it as rather scarce, in 12 tetrads scattered over the administrative county, and generally as an introduction. Habitats included waste places such as rubbish tips, and arable fields, particularly where wool shoddy had been used. The species is given for West Kent by J.E. Lousley in his *Census List of wool aliens found in Britain, 1946-1960*[136], based on a list supplied by David McClintock. By the time of Philp (2010), however, wool shoddy had ceased to be used as an agricultural fertiliser and so *Chenopodiastrum murale* was no longer being replenished as an introduction via this source. The only records of this species then noted were on a rubbish tip at Dartford and disturbed ground at Dungeness. It has been seen in several metropolitan West Kent locations, which were outside the scope of Philp, 1982 and 2010. The total number of records for the period 2010-24 amounts to nine tetrads (the same number at monad level).



***Chenopodiastrum murale* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Chenopodiastrum murale is an annual of disturbed or cultivated ground, particularly where nutrient-rich. Its occurrences are generally casual and if one wished to conserve the species, the measures for doing so are not obvious, other than annually repeated disturbance. The plant has fairly distinctive leaves (indeed, somewhat nettle-shaped), very small teeth around the tepals, and seeds which are keeled around the margin.

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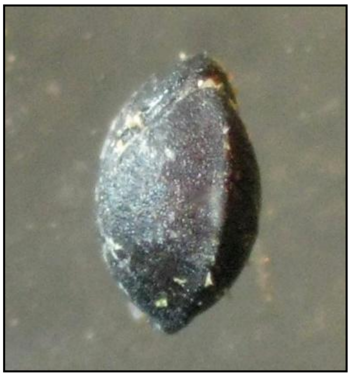
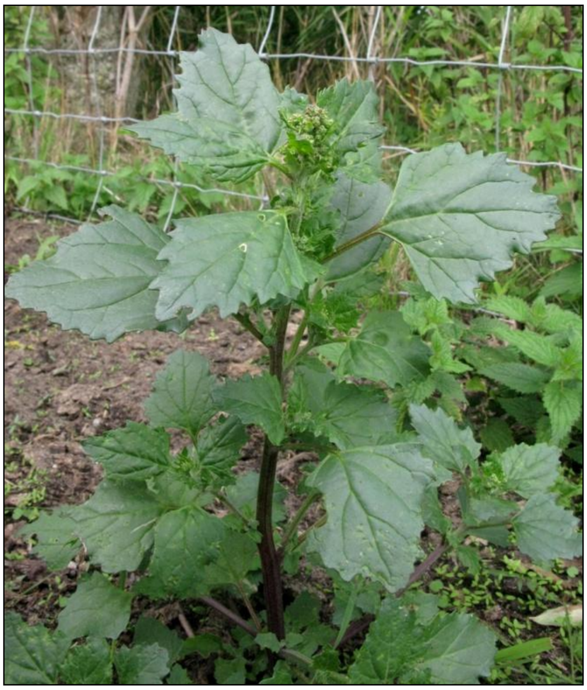
[136] *Proceedings of the Botanical Society of the British Isles* (1961) 4:221-247.



Sandwich. Photo by Sue Buckingham, 21 September 2013, showing keeled seed



Sandwich. Photo by Sue Buckingham, 21 September 2013

In spite of its generally casual and marginal status in Kent, and its national threat status of Endangered, it is a cosmopolitan weed with an adverse impact on crop yield. Its vigorous growth and high reproductive capacity render it competitive in the absorption of nutrients, and it releases allelochemicals which negatively affect neighbouring crop germination and growth. The number of seeds per plant can reach 24,000 and growth can take place within a temperature range of 5°-45°[137]. It is not frost-tolerant, which may limit its competitiveness in Britain as it generally seems to be a late season plant here, which probably implies germination in spring or after, even though globally it can germinate in autumn for over-wintering.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Woolwich north	TQ4379		(1) 23 August 2024 (2) 20 July 2023	(1) MP (2) GH	(1) TQ 431 799, pavement at base of brick wall. May have been on WFS walk led by GH and is in vicinity of his 2023 record. (2) TQ 4322 7994. Albert Road. Ten plants growing in pavement along base of wall.
Pratts Bottom (metropolitan vc16)	TQ4762		24 August 2003	GK	TQ 471 627, at roundabout road-verge, on soil imported with road works. Did not persist.
Danson Park (metropolitan vc16)	TQ4775	Local authority managed park	6 June 2011	MG & MCS	Flower beds and grass path.
Barnehurst (metropolitan vc16)	TQ5073		12 September 2002	MG	TQ 504 763, edge of mown verge of Mereworth Road; conf. EGP.
Barnes Cray (metropolitan vc16)	TQ5275		22 September 2003	GK	TQ 523 755, planted beds in front of commercial development, by A206.
Dartford	TQ5475		20 August 2002	MG	TQ 543 758, Joyce Green Lane; conf. EGP (by whom seen, with PHe, on 1 November 2002 and recorded as at TQ57M).
Spring Head	TQ6172		2 January 2022	DS	Clump growing on fresh earth following recent roadworks to A2 slip road at TQ 6175 7259.
Dungeness	TR01U		After 1990, before 2006	Philp, 2010	Disturbed ground near Boulderwall Farm.
Harty, Sheppey	TR0267		8 August 2021	DS	Growing on dumped spoil from a farmer so likely introduced to the area.
Romney Warren	TR0726	Local nature reserve	(1) 2019 (2) 16 October 2018	(1) & (2) SDA	(1) & (2) TR077261, near visitor centre.
Lydd	TR0419		August – September	TI	*c.* 100 plants on large manure heap

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[137] Bajwa A.A., Zulfiqar U., Sadia S., Bhowmik P. & Chauhan B.S. (2019). A global perspective on the biology, impact and management of *Chenopodium album* and *Chenopodium murale*: two troublesome agricultural and environmental weeds. *Environmental Science and Pollution Research* **26:** 5357–5371.

			2013		in field just outside Lydd on Dengemarsh Rd. Also seen 8 Sept by OL.
Tilmanstone	TR2850		27 June 2023	SC	Tilmanstone coal spoil heap, One plant seen TR 2843 5067.
Sandwich	TR3657	SSSI	21 September 2013	SB	Five flowering plants and 17 seedlings in cow pasture on old dune grassland at TR 36158 57288, near Bird Observatory.

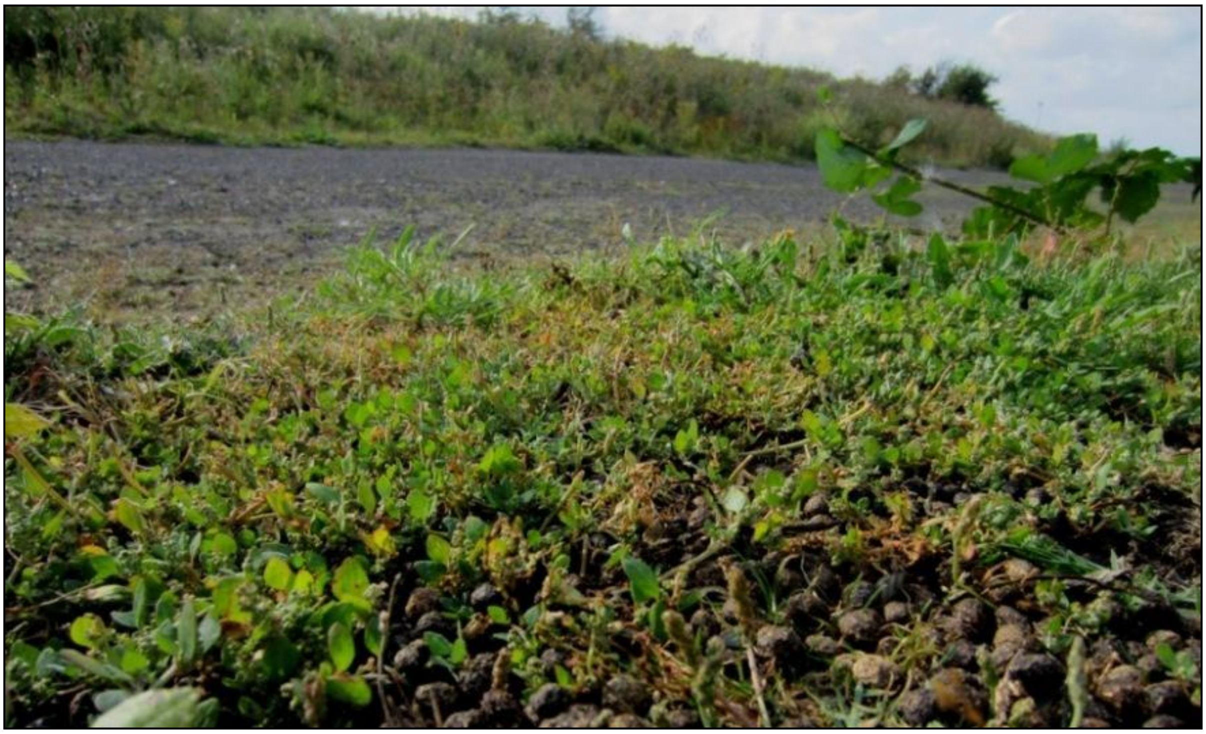
Chenopodium vulvaria L. (Stinking Goosefoot)

vc 15 and 16

Rarity / scarcity status

The decline of the Stinking Goosefoot in Britain was marked before 1930 and has continued now to the point where, from having been fairly widespread in south and central England, it is regarded, both in England and in Great Britain as a whole, as being **Endangered**. Factors such as changes in agricultural practice and pressure on marginal habitats may be entailed. Kent appears to hold the most of the recent occurrences in the few counties where it may be found, and here it is **scarce**. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006.

Cliffe Marshes. Photo by Geoffrey Kitchener, 28 August 2012

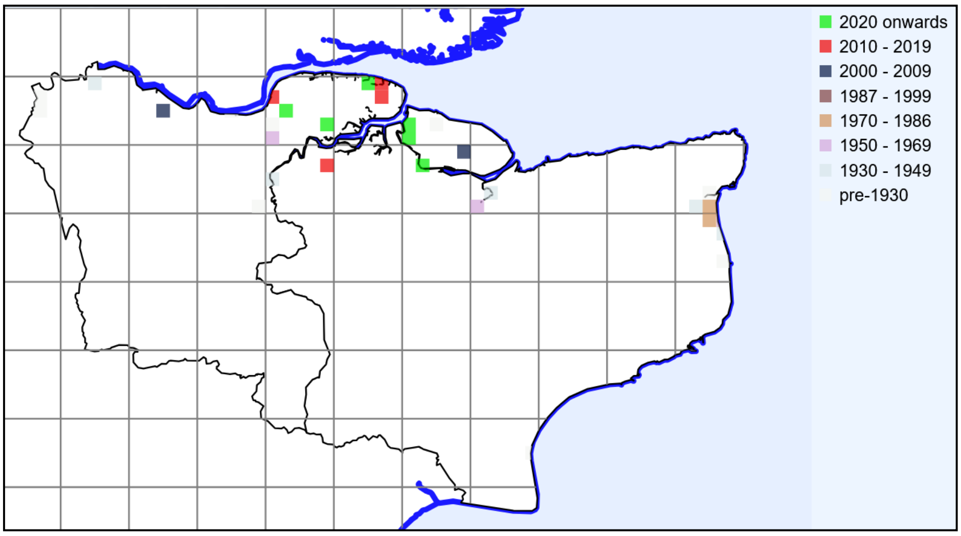


Account

In Kent, *Chenopodium vulvaria* was first recorded in Edward Jacob's *Plantae Favershamienses* (1777) as the Stinking Orache, to be found flowering in August "*Under Walls about the Town – uncommon".* Hanbury & Marshall (1899) gave a fairly wide range of records, generally coastal, and assessed it as local on waste ground near the sea. As Philp (1982) provides only one tetrad record, in Romney Marsh, for the survey period 1971-1980, this gives an impression of catastrophic decline in the county which may well be misleading. In the subsequent survey of 1991-2005, seven tetrad records were made, all in north Kent, with a focus on the Isle of Grain and Sheppey; so the picture appears now to be one of scarcity rather than disappearance.

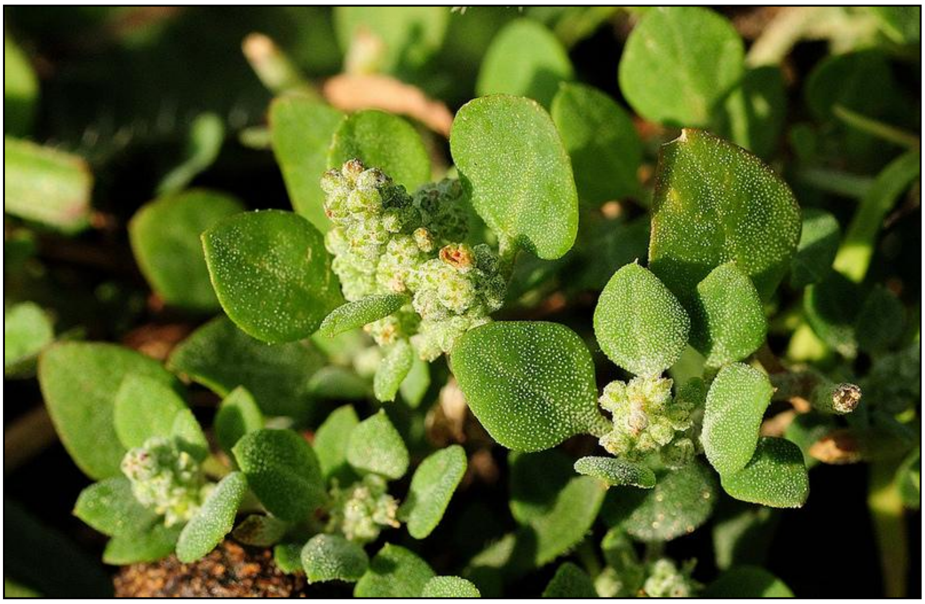
Neither survey has included occurrences of long standing at Princes Golf Links, Sandwich, where it has, however, been seen from 1946 (by Francis Rose on a sandy track north of the old club house) at least through to 1986 (by Francis Rose and Rosemary FitzGerald, when it occurred on the sandy edges of the tarmac road which replaced the track), presumably a survival of Marshall's assessment (1899) of its presence as plentiful between Sandwich and Pegwell Bay, and of its being recorded near Sandwich in 1805; so there is some evidence of earlier persistence.

We have not subsequently picked up continuation at Sandwich, and our 2010-24 records cover ten tetrads (13 monads), so exceeding both Philp (1982) and Philp (2010), with a concentration on the Hoo peninsula and Sheppey, as shown in the accompanying distribution map.



Chenopodium vulvaria **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Cliffe Marshes. Photo by Lliam Rooney, 28 August 2012, showing glands on the leaves, from which trimethylamine diffuses, giving rise to the plant's distinctive odour.



The Stinking Goosefoot is currently treated as an archaeophyte, but was formerly assessed as a native, and often appears like one in the county, particularly by the coast, sometimes inhabiting remote areas and without obvious means of introduction. It is an annual, normally germinating in spring, but sometimes later; and is perhaps most readily recorded late in the year. Whilst fairly distinctive as a greyish prostate plant with rhombic leaves, it is not at all conspicuous, other than as regards its smell, which resembles rotting fish.

Its recent Kent occurrences are almost all in bare disturbed coastal habitats, often by the side of tracks, where there may be light trampling but not severe compaction, such as is more likely to be tolerated by *Chenopodium glaucum* (Oak-leaved Goosefoot), which may also accompany it. Exceptionally, it has been found as a pavement weed, which would be impacted by a higher level of trampling.

A sandy, gravelly or cindery substrate appears to suit the species, penetrated by a strong taproot; but it is highly tolerant of nitrogen enrichment. The plant has been found on artificial banks and thrives in the presence of rabbit grazing; it may be found in sites covered with rabbit droppings. Associated plant species in rabbit-frequented areas were generally ruderals, and in the immediate vicinity of burrows were plants which rabbits avoid, such as nitrophilous *Urtica dioica* (Common Nettle) and toxic *Solanum nigrum* (Black Nightshade). *Chenopodium vulvaria* was seen severely nibbled back by burrows in late season; but evidently there must be some trade-off which enables the species to continue to flourish, in spite of being palatable.

Queenborough, rabbit-nibbled plants by burrow. Photo by Geoffrey Kitchener, 16 October 2012

Another highly nitrogenous site is that on the grazing marshes at Allhallows, where Stinking Goosefoot has been recorded on trampled, somewhat gravelly ground covered with manure, where there is a cattle feeding station. A recent (2015) inland site at Darland Banks, Gillingham also reflected the same factors of disturbance and high nitrogenous soil content.

Allhallows, at cattle feeding station. Photo by Geoffrey Kitchener, 2 October 2012

Site	Grid reference	Site status	Last record date	Recorder	Comments
Bexley (metropolitan vc16)	TQ47		From 1987 to after 1999	DN	A botanist's introduction to an allotment, where it persisted, at least for a while.
Dartford	TQ5475		(1) After 1990, before 2006 (2) 2002	(1) EGP (Philp, 2010) (2) MG	(1) On disturbed western side of Joyce Green Lane. [Not found, October 2012.] (2) TQ 5425 7595 (grid reference is eastern side of Joyce Green Lane).
Cliffe Marshes	TQ7176	RSPB reserve, SSSI	(1) 28 August 2012 (2) 7 July 2011	(1) EGP & DG (2) GK & LR	(1) TQ 71600 76700. Half a square metre of somewhat bare ground. Has been persistent here for many years, at least since 1993 (228 plants were recorded by the KFC in 1995). (2) Two small patches, both covered with rabbit droppings, on margin of cindery vehicular track. TQ 71535 76848 (east side) c.30 x 30cm and TQ71530 76851 (west side) c.50 x 75cm. Associated species included *Picris hieracioides*, *Polygonum aviculare* agg., *Diplotaxis tenuifolia*, *Plantago coronopus*. On the compacted track was *Chenopodium glaucum*.
Cliffe Marshes	TQ7275		2 August 2021	DM & JS	Several plants at TQ 7214 7580 at the edge of track not far from gate.
Darland Banks, Gillingham	TQ7866	KWT managed reserve, Access land	17 & 18 October 2015	SP & DG	TQ 78078 66157, four plants, growing on a hill slope heavily disturbed by scrub clearance, weedy and with indications of nitrogen enrichment. Associated species included *Verbena officinalis, Solanum nigrum, Helminthotheca echiodes, Cardamine hirsuta, Cirsium arvense* and *Potentilla reptans*. Not necessarily associated was the

					appearance of *Solanum laciniatum* resulting from the same clearance.
Hoo St Werburgh	TQ7872		24 August 2021	GK & SK	TQ 7834 7210, a plant c.50cm diameter in pavement of Church Street, with a very small plant alongside.
Allhallows	TQ8478 / 8578	SSSI	(1) 2 October 2012 (2) After 1990, before 2006	(1) GK (2) EGP (Philp, 2010)	(1) About 20 plants, some relatively large, scattered on heavily manured ground used as a feeding station for grazing marsh cattle, from TQ 8499 4842 to TQ 8500 4840. *Chenopodium glaucum* was also present. Both also seen on 12 August 2013, GK.
Isle of Grain	TQ8677	SSSI	(1) 28 July 2017 (2) 18 September 2012 (2) 22 June 1995	(1) BBe (2) GK (2) EGP (Philp, 2010)	(1) TQ 86920 77250, over 20 plants seen around Peat Rd farm buildings. (2) TQ 86921 77221, on gravelly flat ground in front of old cottages/farm buildings by Peat Way, scuffed and amidst rabbit droppings, scattered over c. 1 sq metre. (2) c. TQ 867 774, on the Grain side of Yantlet Creek.
Isle of Grain	TQ8678		After 1990, before 2006	EGP (Philp, 2010)	By some old coastal army workings.
Isle of Grain	TQ8777	SSSI	3 September 2013	GK	About 20 large plants on disturbed ground relating to services works at junction of Peat Way and West Lane, TQ 87076 77038.
Isle of Grain	TQ8778	MOD land, SSSI	28 July 2017	BBe	TQ 87631 78155, five or more plants, on patch of disturbed ground on demolition site with 30+ *Chenopodium glaucum.*
Queenborough	TQ9170		5 July 2020	DC	TQ 916 701. Three flowering plants in gateway entrance next to railway. [Not seen, May 2024, BBe.]
Queenborough	TQ9171		26 June 2024	AL & MA	TQ 9192 7182. Half a dozen plants on hardcore in a development site, Queenborough Rd.
Queenborough	TQ9172		(1) May 2024 (2) 16 October 2012 (3) 2 August 1991 (4) (2) June 1991	(1) BBe (2) GK (3) EGP (4) JP & GB	(1) TQ 915 725, three plants along track, related to disused railway formation south-west of Brielle Way (earlier records are north-east). (2) Numerous plants, bitten down by rabbits and difficult to count, at least 300 on bare disturbed ground of disused banked railway formation (constructed c.1900, closed 1950) around rabbit burrows for 300m from TQ 91540 72568 to TQ 91764 72774. Terrain is made ground with soil, shelly shingle, cinders and chalk lumps. Main associate *Solanum nigrum*, also present *Mercurialis annua*, *Urtica urens*, *Urtica dioica*, *Carduus tenuiflorus*. (3) TQ915726; bank of disused railway, heavily rabbit-grazed. Specimen in **MNE**. (4) Discovered at TQ 916 726, 100+ plants. Written up by JP in *Bulletin of The Kent Field Club* (1992) 37:38.
Elmley	TQ9267	SSSI	(1) 24 September 2023 (2) 22 September 2017	(1) AL & JM (2) DC	(1) TQ92666782. Associated species: *Agrostis capillaris, Carduus tenuiflorus, Cerastium fontanum, Cirsium vulgare. Dipsacus fullonum, Geranium molle, Helminthotheca echioides, Jacobaea vulgaris,*

					Lolium perenne, Medicago Arabica, Medicago lupulina, Plantago coronopus, Plantago lanceolata, Poa annua, Polypogon monspeliensis, Potentilla reptans, Reseda luteola, Sedum album, Trifolium repens. (2) TQ 92613 67859, a single plant on gravelly compacted ground, rabbit-frequented, at remains of 19th C Elmley cement works and related dock.
Eastchurch Marshes	TQ9869		29 September 2005	EGP & DG	TQ9808 6984: trackside near gate to Great Bells Farm, rabbit-disturbed. [Not found, October 2012 or August 2019, GK. Rabbit disturbance still present but may be reduced.]
Princes Golf Links, Sandwich	TR35P, 36K		4 October 1986	EGP	Specimens in **MNE** from edge of track. Other specimens (without OS grid reference) in **MNE** go back to 1946 (FR). Also recorded for August 1986 (over 150 plants) by FR & RF for TR 356 593 and TR 355 596; and RF for TR 354 600. [Not found, October 2012, September 2013.]

Cichorium intybus L. (Chicory)

vc 15 and 16

Rarity / scarcity status

Chicory is currently regarded as an archaeophyte, or ancient introduction, having earlier been treated as a native, and is widespread in England and Wales, less so in Scotland and Ireland. Although there has been a general decline (probably due to its decreased use as a crop, and hence diminished opportunities for recruitment to wild populations), the species is not specified as at risk in Great Britain as a whole , its conservation status being one of 'Least Concern'. However, in England there evidence of decline sufficient for it to be treated as **Vulnerabl**e to the threat of extinction in the wild. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 35% in the likelihood of recording the species. In Kent, it is neither rare nor scarce but, comparing the periods 1971-1980 and 1991-2005, Philp (2010) shows a major decline in tetrad records of 51% over those given in Philp (1982). This appears overstated: a comparison between 1971-1980 and 2020-23 (excluding any effect of Philp (1982) not covering metropolitan vc16) gives only 13%.

Fawkham. Photo by David Steere, 30 August 2013

Account

Cichorium intybus was first recorded in the wild in Kent by Thomas Johnson on 13 July 1629, in the course of pursuing the main road from Gravesend to Rochester *(Iter Plantarum*, 1629). Hanbury & Marshall (1899) stated that it was common on fields and roadsides in most parts of the county, especially on chalk. However, it does not feature in a number of earlier accounts of the Kent Flora, and there is reason to suppose that it may have been commonest in the north west. For example, Daniel Cooper in his *Flora Metropolitana* (1836) noted it on the roadside between Dartford Heath and Green Street Green, at Darenth Wood, on Gravel Hill between Swanscombe and Northfleet, and at Lewisham chalkpit; and Eyre De Crespigny in his *New London Flora* (1877) referred to Chicory in the area of the North Downs near Sevenoaks, at the hills east of Wrotham, and at Cobham / Cuxton.

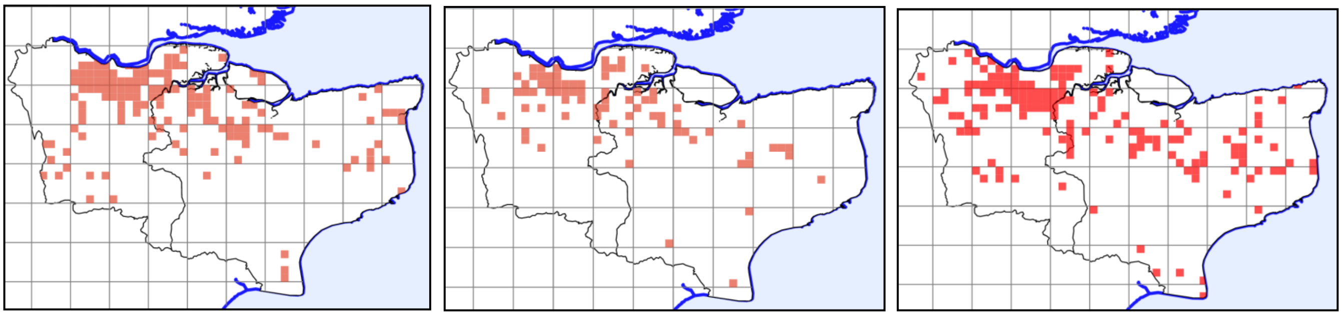
Farningham Wood. Photo by David Steere, 20 July 2013

Philp (1982) treated the species as probably native in Kent, and found it to be frequent on roadsides and waste places, especially on chalky soils, with a total of 143 tetrad records. These carried a heavy concentration in the north west of the county. In Philp (2010) only 70 tetrad records could be found, and *Cichorium intybus* was described as 'introduced (archaeophyte) but with some justification to be considered native… on roadside verges, field margins and rough grassland'. No comment was offered on the cause of this apparently significant decline. The cause is unlikely to be an issue of habitat loss, since roadside and ruderal areas continue to be available. It may be that the 'national' explanation of diminished use in cultivation applies, although there is still some Kent use of Chicory as part of a fodder crop, and the species can be found in some wildflower and game bird food seed mixes. It was seen, for example, near Harrietsham in

2015 in a field with game bird food species such as *Echinochloa frumentacea* (White Millet), *Raphanus sativus* (Garden Radish) and *Setaria pumila* (Yellow Bristle-grass); and in 2022 in a 'wildflower' meadow near Broughton.

Records for 2010-24amount to 146 tetrads (200 monads) and, by nearly restoring the numbers found by Philp (1982) for 1971-80 (taking into account that 12 of the recent tetrads lie within Greater London and so outside the scope of the 1971-80 recording exercise), suggest that there was not such a decline as the 1991-2005 survey suggested. This can be illustrated by comparing BSBI database tetrad records (below) for 2010-24, 1987-2009 (covering Philp, 2010) and 1970-86 (covering Philp, 1982). It certainly looks as though the period 1987-2009 represents under-recording in comparison with the periods before and after. Other points to note are:

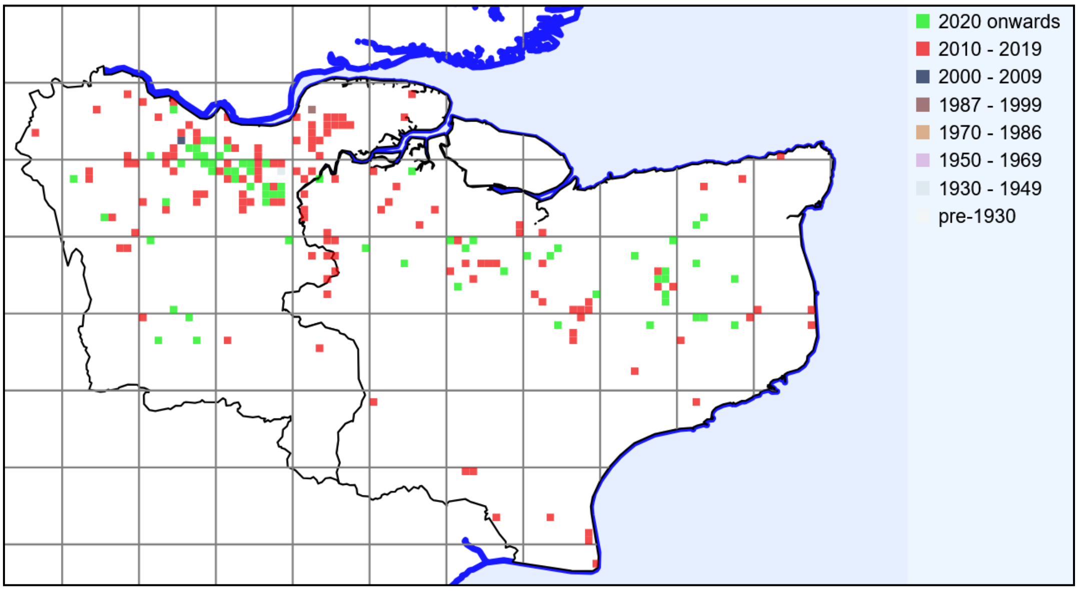
- the lack of older records in metropolitan north west Kent reflects the confinement of Eric Philp's recording to the administrative county of Kent.
- Setting aside the concentration in north west Kent throughout, there are secondary issues arising out of the mapping, including whether some of the 1970-86 scattering in south-west Kent in 1970-86 was 'come-and-go', or has been substantially missed since.



***Cichorium intybus* tetrad records from BSBI database**

1970-86 1987-2009 2010-24

The current position is shown below, at fuller resolution, recording at monad level having been undertaken since 2010.



***Cichorium intybus* Kent records to 2024 mapped at monad level, from BSBI database.**

Cichorium intybus is a perennial and, once established, its thick tap-root should enable it to penetrate below shallow soils and withstand drought conditions.

Our recent records suggest both wild (on roadsides) and sown (wildflower) status; seed is sold for its purported qualities as a bee-friendly plant. These qualities may be overstated. Feltwell (2017)[138] refers to its flowering abilities (inflorescences were produced every day, often over 100, so that a single large plant produced 1,828 over 17 days), but these were not matched by any particular attractiveness to bees. Its appearance on agricultural grassland may well be due to its inclusion in GS4 seed mix, intended to produce legume and herb-rich swards for countryside stewardship grants in relation to the conversion of arable land, temporary grassland or permanent grassland cultivated and re-sown in the last five years. DEFRA/Natural England recommend it for GS4 as 'Chicory is a highly productive species, eaten by cattle and sheep and effective in protecting against internal parasites'[139].

Habitat, common land, Green Street Green.
Photo by Geoffrey Kitchener, 19 July 2015

The arguments for non-native status include the absence of fossil record; a history of cultivation; and a predilection for open, ruderal habitats. We do not yet have data as regards the extent to which our plants are the possibly native subsp. *silvestre* or other introduced subspecies. Stace's *New Flora of the British Isles* (2019) says that our commonest wild plants are subsp. *silvestre* with deeply dissected lower leaves and the cultivated salad plant is subsp. *intybus*; nothing is said about subsp. f*oliosum*, which is given in Sell & Murrell's *Flora of Great Britain & Ireland*, vol.4 (2006). The latter say that subsp. *silvestre* is a possible native; that subsp. *intybus* is the crop plant, noting that it may be grown for root or seed; and that subsp. *foliosum* may be grown as salad or vegetable; but all three may occur in wildflower seed. It is not clear what the status is of the frequent agricultural sowings of the plant, not as a crop, but alongside grass and legume sowings as a soil conditioner, due to the deep taproot, or to contribute to grazing or for game cover. The following table gives differences between the subspecies.

***Cichorium intybus* subspecies characters**

Character	silvestre	intybus	foliosum
Inner involucral bract length and shape	10-12mm, linear-lanceolate	13-15mm, oblong-lanceolate	10-12mm, linear-lanceolate
Height	to 100cm	to 150cm	to 200cm
Basal leaves	deeply divided	undivided, but may be toothed	lettuce-like, broadly ovate to reniform

Subspecies *foliosum* was recorded by Alan Heyes at the Barden Lake nature reserve, Haysden, TQ 5717 4610 in an area heavily disturbed in 2023 by footbridge construction. The stem measured a remarkable 277cm and was profusely branched (17 upper branches spaced 9-16cm apart), carrying broad lettuce-like leaves diminishing in size up the stem. This subspecies, however, as a presumed non-native, is not a taxon which warrants rare plant register status.

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[138] Feltwell, J. (2017). Chcory (*Cichorium intybus* L.); its contribution to pollinators and its staus in Kent and Sussex. *Transactions of the Kent Field Club* **20**: 13-20.

[139] https://www.gov.uk/countryside-stewardship-grants/legume-and-herb-rich-swards-gs4#herbs (accessed 27 February 2022).

Cicuta virosa L. (Cowbane)

vc 15 (introduced) and 16 (spread from introduction)

Rarity / scarcity status

Cowbane is a local plant, primarily of East Anglia, west central England and Ireland, and regarded as nationally scarce, but with fairly stable populations. It is accordingly treated as carrying no particular conservation concerns, both in England and in Great Britain as a whole. The species has not traditionally been regarded as part of the Kent flora. It has been recorded as an established introduction in East Kent and as present in a natural waterside habitat in West Kent; in which it appears to have arrived, river-borne, from an introduced population upstream. Accordingly, its status for the purposes of the Kent rare plant register is marginal, although it is **rare** in the county.

Sheldwich. Photo by Heather Silk, September 2010

Account

Hanbury & Marshall (1899) were not satisfied that *Cicuta virosa* had ever been found in Kent. Records for Canterbury and Ashford published in 1805 had already been discounted, as attributable to *Oenanthe fluviatilis*. The authors also entirely distrusted records for Graveney and from Minster, Monkton and St Nicholas Marshes, on the basis that *Berula erecta* or *Oenanthe crocata* were more likely.

No confirmed sightings[140] were identified until 2005, when it was located by Susan Pittman (confirmed by Joyce Pitt) on the banks of the River Eden near Penshurst (TQ 5185 4393). This was a surprising discovery: the nearest other current populations were at Burton Mill, Sussex, East Anglia or introduced at Camley Street Nature Park in London. Despite it being a fairly sizeable umbellifer, it was inconspicuous as being set low near the water, with obscuring vegetation on the banks above. It was visible from the opening afforded by a fishing point. It has not been re-found there on subsequent search.

Hever Castle water maze, with Cowbane. Photo by Stephen Lemon, 14 June 2014.

However, in 2014 Geoff Joyce pointed out that there was a potential source upstream (7km or so) at Hever Castle, where the plant is grown in the water maze, constructed in 1997 on the north side of the lake fed by the River Eden. From there, it has become naturalised in places along the northern lake margin (per Stephen Lemon, 14 June 2014); and seed (or the new overwintering rootstocks which form at the base of the old one which dies at the end of the year, and which are capable of detaching themselves and forming propagules) would be capable of being carried onward by the River Eden. It was noted as still present in December 2019, September 2021 and

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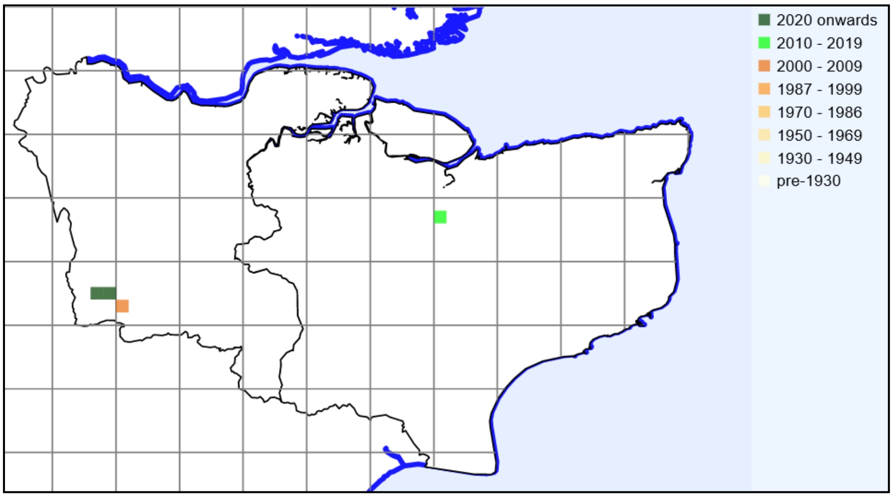
[140] However, a 2001 record for the lake off Waterfall Road, Hothfield (TQ 978 445) may warrant further investigation.

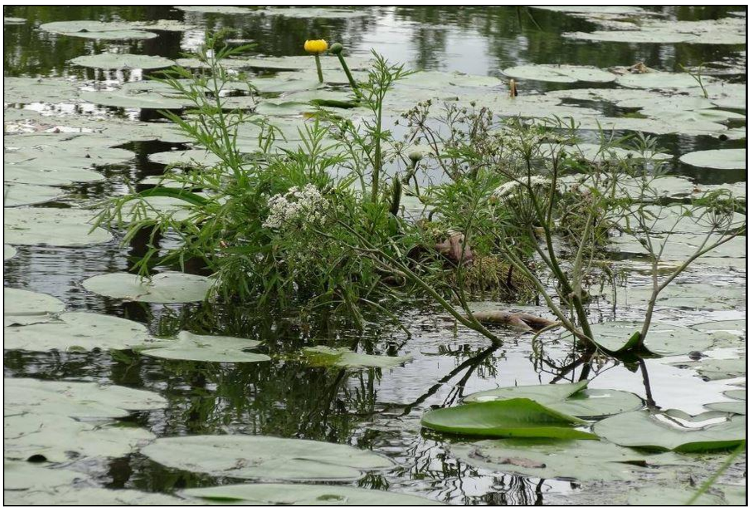
October 2022, and had spread to the south eastern and south western margins of the lake. So whilst it is fair to assume that Cowbane was not planted at Penshurst, it apparently derives from an introduced source, viz. Hever.

***Cicuta virosa* Kent records to 2024 mapped at tetrad level, from BSBI database.**

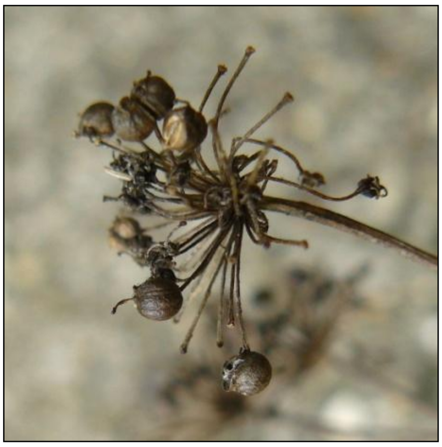


On 16 September 2010 it was also identified by Heather Silk at Sheldwich (TR 011 565), where there were ten to fifteen plants around and in the middle of the school pond, constructed about 20 years before. There was no local knowledge as regards its planting, but the assumption must be that this was originally an introduction, although by then well established. Its discovery caused some local concern because of its toxic reputation, although it might be queried whether a common (but also poisonous) plant such as *Oenanthe crocata* would have caused the same apprehension. The future of the site was not secure, as it became earmarked for a school extension.

Cowbane is a perennial which grows in shallow water at the margins of ponds and rivers. It is distinctive by virtue of the long, narrow, toothed segments of its compound leaves, and its globular fruits.



Hever Castle lake. Photo by Stephen Lemon, 14 June 2014



Sheldwich. Photo by Heather Silk, September 2010

Cirsium eriophorum (L.) Scop. (Woolly Thistle)

vc 15; long gone from vc 16

Rarity / scarcity status

Cirsium erophorum is not uncommon on chalk, limestone and calcareous clay in central south England, being probably most abundant in Avon, Gloucestershire, Oxfordshire and Wiltshire. It is less frequent further north, extending as far as Co. Durham, and is very local in the south east. Indeed, its presence in Kent is something of an outlier, otherwise growing no nearer than Coulsdon. Its threat status is of 'Least Concern', both in England and in Great Britain as a whole. In Kent, it is confined to East Kent and is **scarce**.

Cheriton Hill. Photo by Lliam Rooney, 2013

Account

The first published record for Woolly Thistle in Kent is in a paper submitted by Lewis Dillwyn to the Linnean Society in 1801, a *Catalogue of the more rare Plants found in the Environs of Dover, with occasional remarks*[141], in which it is referred to as "about a farm called Polton, near Raddigund's Abbey; and about the ruins of Lymne Castle". Although it was given in a list of plants at Stone chalk pit published by Daniel Cooper in 1836, it seems to have had very little presence in West Kent and its core Kentish distribution has always been in East Kent, especially on the chalk around Folkestone.

Hanbury & Marshall (1899) referred to it as rare, on downs, etc., on chalk and greensand. In the mid-1950s, Francis Rose[142] mentioned its primary locations as at Postling Downs and Cheriton Downs, where it persisted in abundance. It is still (2013) plentiful in the Cheriton Hill area: 800 plants have been counted in this vicinity. Philp (1982) gave it in six tetrads, reduced in Philp (2010) to four, all still in the Folkestone area and relating to roadside and other grassy areas on the chalk. One of the four tetrads relates to Beachborough, a site of long standing, since it is mentioned in Hanbury & Marshall (1899). Arpinge is in this vicinity, and 600 plants have been counted in 2013. Our 2010-24 records have raised the total to five tetrads (seven monads) and although these are not all the same sites as were recorded previously there do not seem to be any particular distribution trends other, perhaps, than the absence of recent record away from the chalk.

Cheriton Hill. Photo by Geoffrey Kitchener, 11 July 2013

Our 2010-24 records all relate to the North Downs chalk escarpment, from Postling to Folkestone, which has been its 'normal' habitat here. However, it has been found on ragstone, cf. Dillwyn's 1801 record at Lympne Castle mentioned above (followed by an 1823 specimen collected by Richard Peen, which went into Robert Pocock's herbarium), and the records near Aldington and Hythe given in the table below appear to be on Lower Greensand Group strata.

Woolly Thistle is a tall (usually) biennial plant, distinctive by virtue of its stature and the very large, almost globular flower-heads with their bracts enveloped in white woolly hairs.

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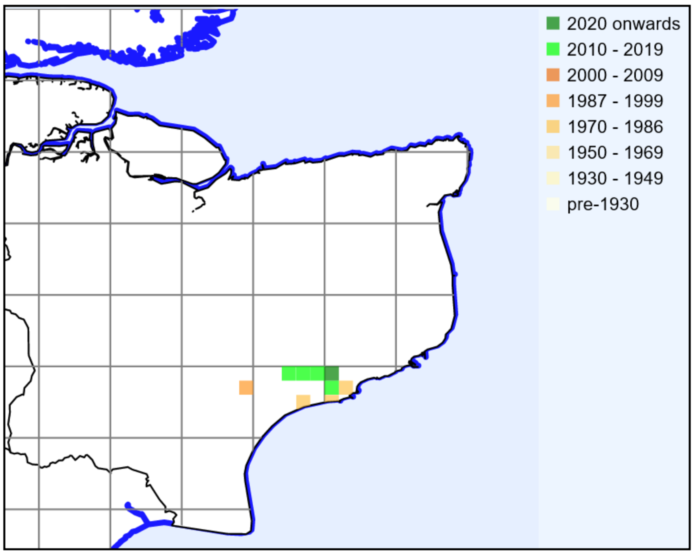
[141] *Transactions of the Linnean Society* (1802), 6: 177-184.

[142] F. Rose (1960). Botanical Records for Kent 1955-58 – vascular plants. *Transactions of the Kent Field Club* 1: 56-65.

Its scarcity in Kent (and Sussex and Surrey) may be attributable (Tofts, 1999[143]), not so much to lower rainfall than is found in its core national areas of distribution, but to the effect of the summer water balance (i.e. the difference between rainfall and evaporation), the species being scarce or absent from areas where an agricultural drought might be expected in more than five summers out of ten. Open ground will assist germination and establishment, and it appears tolerant of trampling on path-sides; but it will grow in rank grassland. Because of its spines it is not susceptible to grazing other than when young; and rabbits appear to avoid it. Mowing is deleterious.



Cirsium eriophorum **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Site	Grid reference	Site status	Last record date	Recorder	Comments
Between Aldington and Sellindge	TR03Y		After 1990, before 2006	EGP (Philp, 2010)	
Postling	TR1439		(1) 26 May 2016 (2) 6 June 2010	(1) SC (2) AG	(1) TR 146 393, ten plants. (2) Two rosettes seen at the eastern end of the downs during KFC visit. Hanbury also saw it near Postling Church, before 1899.
Hythe	TR13S		After 1970, before 1981	Philp (1982)	TR13S.
Beachborough	TR13U		After 1990, before 2006	EGP (Philp, 2010)	A location given in Hanbury & Marshall (1899). This tetrad includes the sites TR1638 and TR1738 set out below.
Etchinghill / Beachborough	TR1638				Two flowering plants at TR 1630 3815 and a few rosettes scattered across chalk escarpment.
Near Etchinghill	TR1738	TR 1812 3884	12 August 2013	AG	Several plants at TR 1788 3874.
Arpinge	TR13Z		After 1990, before 2006	EGP (Philp, 2010)	May be the same area as either of the next two entries.
Arpinge - Peene	TR1838	MOD land, SSSI	(1) 12 August 2013 (2) 18 June 2011 (3) August 2010	(1) AG (2) SB (3) AG	(1) Estimate of 600 flowering plants in vicinity of TR 1812 3884. Total number of plants probably in thousands. Most at head of main Arpinge combe in patches of grassland that were cleared of scrub by MOD a few years before. (3) Single plant on chalk slope TR 18434 38685, KFC meeting on Army land. (3) Abundant in disturbed ground at the base of the downs.
Folkestone - Cheriton	TR1938		(1) 30 July 2010 (2) 7 August 2009	(1) SC (2) RM	(2) TR 198 383.
Cherry Garden	TR2037		11 June 1997	FR	Occasional
Cheriton Hill	TR2038	SSSI	(1) 25 June 2022 (2) 4 August 2021 (3) 20 August 2013 (4) 11 July 2013	(1) KBRG / WFS meeting (2) & (3) CO (4) PG, LR & GK	(1) A cluster of plants at TR 207 380, by old earthworks. (2) TR2038. (3) 15 plants (14 flowering) at top of escarpment adjoining road from TR 201 382 to TR 210 382. Usually a

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[143] R. Tofts (1999). *Cirsium eriophorum* (L.) Scop. (*Carduus eriophorus* L.; *Cnicus eriophorus* (L.) Roth). Biological Flora of the British Isles. *Journal of Ecology* 87:529-542.

					few additional plants along rest of escarpment around triangulation point. (4) Chalk downs escarpment in various locations, e.g. disturbed ground at TR 2055 3820, rosettes on trampled path-side around TR 2076 3807, large plant at TR 2073 3805. PG has counted 800 plants in the Cheriton Hill area some years before.
Folkestone – Castle Hill	TR2137	SSSI	(1) 5 May 2017 (2) 13 August 1991 (3) 22 June 1986	(1) SB & AG (2) JP (3) FR	(1) A single plant at TR 2147 3790 (2) Castle Hill. (3) Round Hill to Castle Hill, chalk scarp.
Folkestone	TR23E		After 1990, before 2006	EGP (Philp, 2010)	May be same as last entry.

Cladium mariscus (L.) Pohl (Great Fen-sedge)

vc 15, planted in vc16

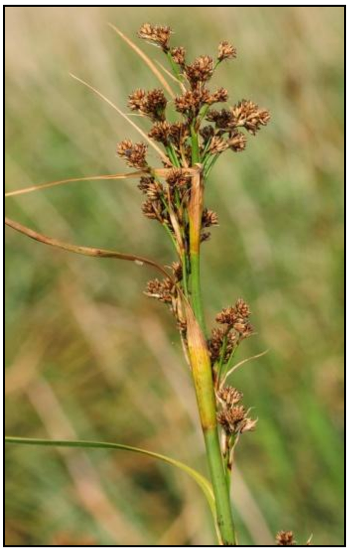
Rarity / scarcity status

Great Fen-sedge is widely scattered and locally common in the British Isles, primarily in East Anglia, West Scotland and in Ireland, its conservation status being of 'Least Concern', both in England and in Great Britain as a whole. In Kent it has in recent times been restricted to four sites, and is very **scarce**.

Habitat at Dungeness. Photo by Geoffrey Kitchener, 20 June 2012

Account

Cladium mariscus was first recorded in Kent by Lewis Dillwyn 'In Ham Ponds near Eastry' in a listing of East Kent plants presented to the Linnaean Society in 1801 (published in their Transactions of 1802). Hanbury & Marshall (1899) give other historic records in this general area, but not elsewhere. It remains at Ham Fen, an area at which alkaline peat developed where the historic Stour estuary (since reclaimed and now inland) received drainage from the chalk. Francis Rose, in his manuscript *Flora of Kent*, described it as locally dominant in patches, over about three acres of rough fen, its remains occurring at a considerable depth in the peat of this ancient fen. This colony is the last relic of a species formerly widespread in the fens between Deal and Sandwich. It is now by no means as extensive as the three acres described earlier, but is rather a few small, scattered patches; however, the discovery in2018, in the northern part of the fen reserve, of patches in an area re-profiled to keep it wet, suggests that regeneration may be taking place, although breaking the dormancy of *Cladium mariscus* seeds appears not to be straightforward.



Dungeness. Photo by Lliam Rooney, 20 June 2012

It is also present at Dungeness, from where Francis Rose collected material in 1952-54, describing the site as a fen developed from a former freshwater pond. The colony was then, or in the early 1960s, estimated by him at about 20m across, although in 1963[144] it was given as about 15 yards across, roughly circular, and in an area slightly more acid than that occupied by neighbouring reeds (pH 5.7 compared with 6.0-6.1). In 1997 Francis Rose noted it as about 50m across, but this is surprising, and maybe 50 feet was meant. A location analogous to that at the Dungeness RSPB reserve (not given in Philp 1982 or 2010, but probably now lost) has also been recorded at the Lydd Ranges.

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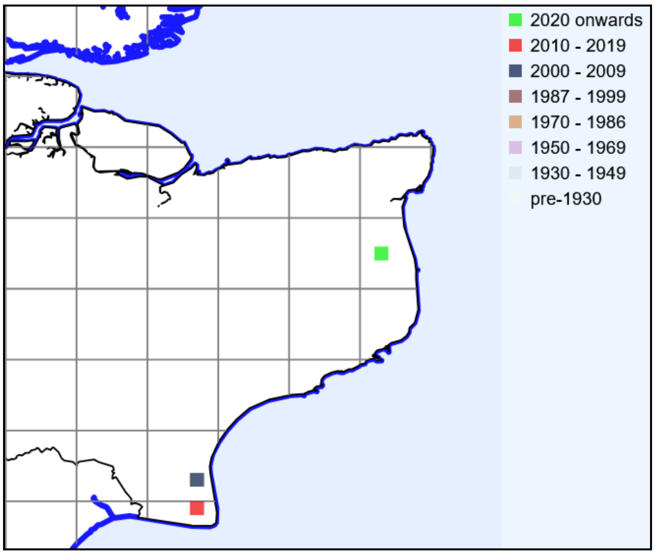
[144] V. P. Harden (Pollard) (1963). Unpublished Dissertation on Dungeness Foreland.

Its presence at Hare and Billet Ponds, Blackheath, vc16 (2012, JC), is not given in the data table or map below and is doubtless an introduction, perhaps with the intention of 'improving' the native flora.

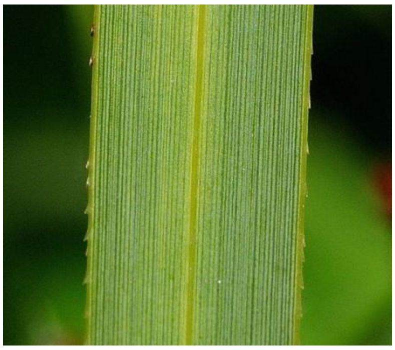
***Cladium mariscus* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Dungeness. Photo by Geoffrey Kitchener, 20 June 2012

Great Fen-sedge is found in wet areas, often base-rich, where its creeping rhizomes give rise to dominant patches of coarse growth. It would potentially be at risk if lowering of the water table occurred at any of its sites. The water table should usually be above root level and not more than about 15cm below soil level, nor more than 40 cm above.[145] Short periods of reduced water table in summer are tolerated.

It is not readily confusable with other sedges/rushes, and is notable for the saw-toothed leaf margins.



Dungeness. Photo by Lliam Rooney, 13 July 2013

Site	Grid reference	Site status	Last record date	Recorder	Comments
Lydd Ranges	TR0319	MOD land, SSSI	c. 1990-91	BF	Inside the fence along Galloways Road near Lydd Camp, and in a small wetland hollow, on the edge of a tongue of shingle projecting into marsh, TR 0398 1939. This area (2012) since heavily scrubbed over, and the plant is believed lost.
Dungeness	TR0618	RSPB reserve, SSSI	(1) 27 November 2016 (2) May 2012 (3) 15 June 2010	(1) BBS meeting (2) BB (3) GK	(1) West side of Open Pit 6 (Cladium Pit), TR06521838. Phragmites dominated peat in wet open fen. Strong growth along north western corner of pit. (2) Recorded as at the freshwater pit (no. 6), TR 0652 1840. Additionally, a young plant, found in the interior of pit no.6 in 2011, was not re-found in 2012. (3) Recorded as at TR 0653 1839 (same site). There is a long

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[145] Conway, V.M. (1942). Cladium Mariscus (L.) R. Br. *Journal of Ecology* **30**: 211-216.

					recording history at this location, at the western end of pit no. 6. It is (2010) in a crescent shape (each horn being c. 15m long, and the width of the colony up to 5m), following the curve of the end of the pit. There is *Phragmites australis* adjoining on the (wetter) inside of the curve and *Juncus* spp are on the outside.
Greatstone	TR02R		28 July 2000	EGP (Philp, 2010)	A few clumps in a small marshy area at a dyke, north Romney Salts. [Not found, 2013, GK.]
Ham Fen	TR3354, TR3355	SSSI, KWT managed reserve	(1) 28 July 2024 (2) 13 June 2024 (3) 21 July 2018 (4) 19 July 2017 (5) 1 August 2012 (6) 26 August 2006 (7) After 1990, before 2006	(1) AL & TS (2) AL & CA (3) KBRG / KFC meeting (4) SB & SL (5) SB (6) JS (7) EGP (Philp, 2010)	(1) TR33165517. Wettest past of the field. Ham Fen. (2) TR330552, Ham Fen (3) A patch 2.5 x 3 metres at TR 33176 55162, consisting of 30 flowering/fruiting spikes. Nearby at TR 3313 5516 was a small patch of five spikes, with just one at TR 3316 5515. The plants were in an area of damp/wet calcareous fen peat which was re-profiled 15-20 years ago in order to keep it wet. *Cladium* has not been recorded from this monad in recent years and so could be supposed to have arrived in response to the re-profiling. The long known location for the species at Ham Fen is some 330 metres south west in TR3354. (4) Ham Fen. Three fruiting spikes seen at TR 3338 5492 (5) Six to ten flowering spikes at TR 33382 54920. (6) TR 3309 5483. (7) Recorded as T35H. [This is our oldest site, from 1801, and known to FR in the 1940s as locally dominant, occurring as a series of scattered, extensive patches.]

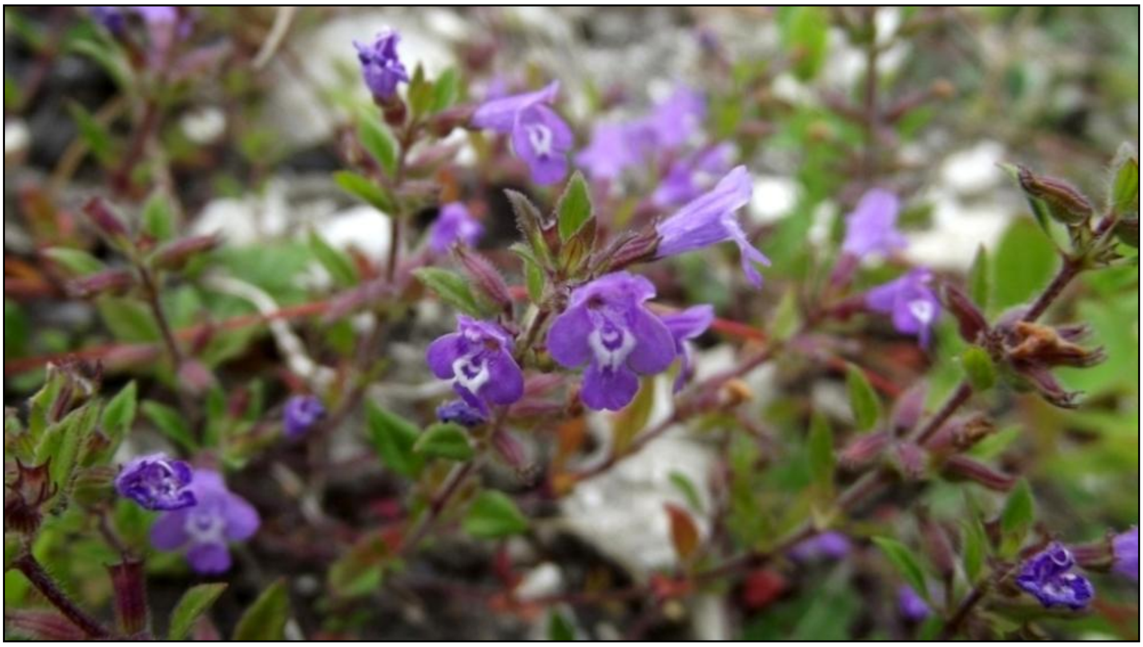
Clinopodium acinos (L.) Kuntze (Basil Thyme)

vc 15 and 16

Rarity / scarcity status

Clinopodium acinos is an annual requiring open ground and favouring calcareous soils, often found on eroding slopes, disturbed dry grassland and decreasingly on arable margins. Its arable presence has been diminishing as a result of more efficient weed control and this has led to its designation as **Vulnerable**, both in England and in Great Britain as a whole. As a result of its marked decline it is also treated as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. In Kent there is also evidence of substantial recent decline, although it is still sufficiently widespread, albeit under threat, that no rarity or scarcity designation is applied yet. It is a Kent axiophyte, indicative of good habitat.

Betteshanger (formerly Fowlmead)[146]. Photo by Mel Lloyd, July 2011



Account

Basil Thyme was first recorded in Kent by Johnson, who found it on both of his Kent journeys. The first of these occasions was given in his *Iter Plantarum,* being on 14 July 1629, when the plant was found on climbing the hill from Chatham towards Gillingham. Hanbury & Marshall (1899) assessed it as frequent on rough banks and in dry fields, especially on the chalk downs, and occurring in all botanical districts. This last observation might suggest that the species extended, presumably in arable, into the Weald (which it does not do now); but Hanbury and Marshall constructed their southern botanical districts so as to run northwards as far the downs, and this could account for the reference to all districts. Francis Rose considered it to be frequent on rough ground, open grassland and arable land on chalk, but very rare elsewhere. By the time of Philp (1982), Basil Thyme was regarded as rather local, usually on the chalk, and it was recorded in 87 tetrads in the administrative county. A major decline seems to have taken place by the survey of 1991-2005, published in Philp (2010), when only 21 tetrads were listed. It is assumed that the reasons for this are principally the same as apply nationally, viz. changes in weed control.

It is regarded nationally as a good indicator species for a threatened habitat, but this may be in the context of the conversion of chalk and limestone pastures into arable, perhaps more applicable to areas other than Kent, where the wider threat is one of development. Nonetheless, its presence in Kent generally indicates a habitat with potential for good quality flora: it has been recorded in conjunction with *Ajuga chamaepitys* (Ground-pine) and *Vulpia unilateralis* (Mat-grass Fescue). All these are species favouring sunny, crumbling semi-bare chalk slopes. Basil Thyme is a component of the *Festuca ovina- Carlina vulgaris* (CG1) plant community, and the *Festuca ovina- Hieracium pilosella- Thymus praecox / pulegoides* (CG7) community.

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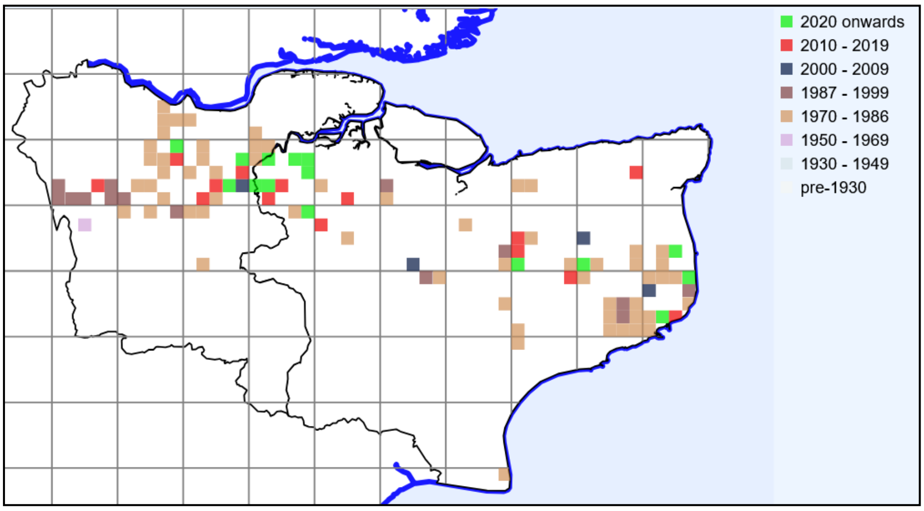
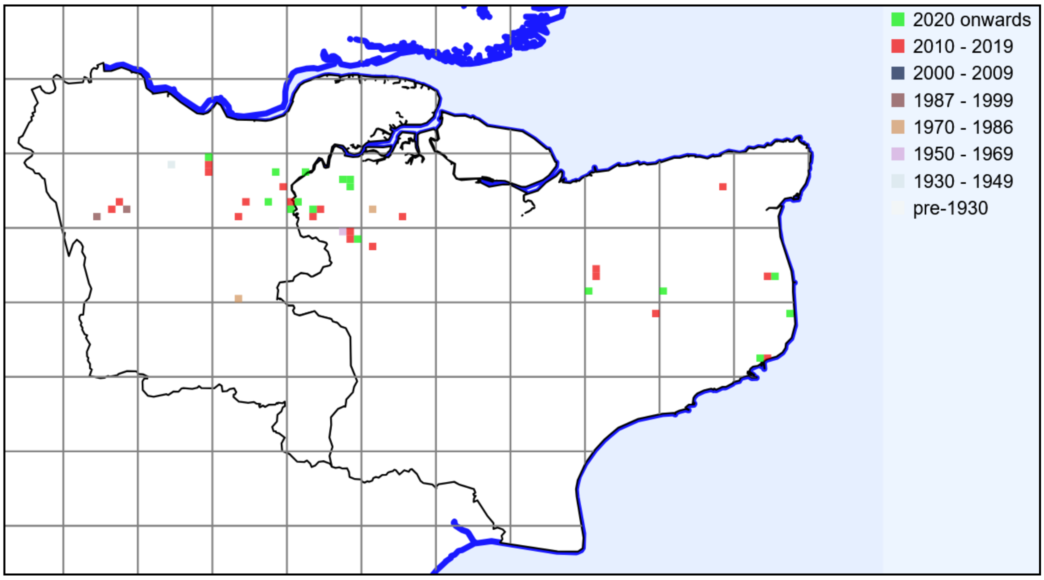
[146] A site under threat 2022-23 from development.



***Clinopodium acinos* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The 2010-24 recording data, with records from 29 tetrads (36 monads), have now exceeded the number of tetrads recorded in Philp (2010). But while it is evident that the same general chalk-related distribution pattern is shown, many of the sites are different. That brings into question whether earlier sites have become unsuitable, perhaps with lack of disturbance. However, there is still a very high level of loss, 69%, since the 1970s. The main losses appear to be from the Downs west of the Medway as far as Polhill and their dip slope north towards the Thames estuary, and from the chalk inland of Dover.

***Clinopodium acinos* Kent records to 2024 mapped at monad level, from BSBI database.**



Mapping at monad level, as above, shows distinctly the skeletal level of current distribution (there are fewer old records as monad recording only really developed in Kent from 2010).

Basil Thyme is an annual or short-lived perennial, requiring open, dry and light conditions for germination, generally on a nutrient-poor substrate to avoid competition, and some seeds are able to remain viable in the seed-bank for more than five years; so its characters are consistent with population fluctuations driven by disturbance.[147] Our 2010-24 records are often noted as being in otherwise bare chalk areas, e.g. on eroded chalk slopes, by paths and roads, in old chalk pits, on arable margins and arable reversion. On occasion, we have noted related causes of disturbance, such as rabbits, ant nests, the creation of a new path and gate a year or so before, and (giving effect to the previous year's disturbance) the withholding of horse-grazing from a paddock where a vast spread of plants 15m into the paddock resulted. Often the plant has been recorded in small numbers, but occasionally we have noted 100 or more, e.g. alongside arable at Burham, by the A249 at Stockbury, and over 1,000 on a chalk slope and car park near Fawkham golf course.

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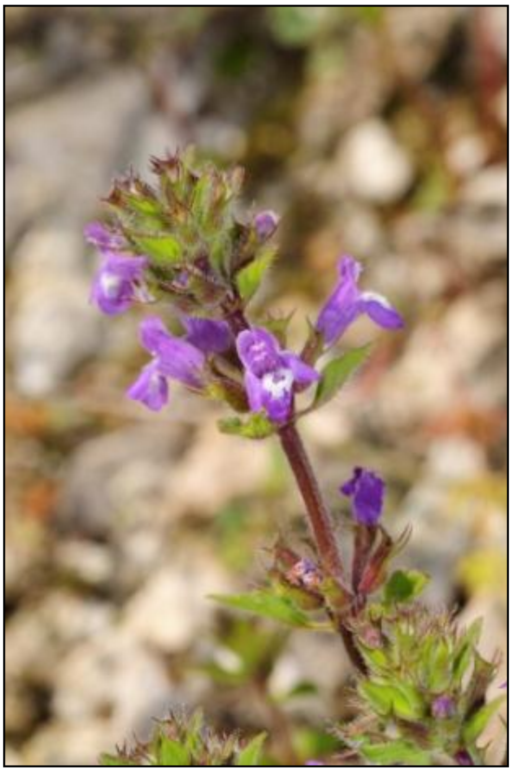
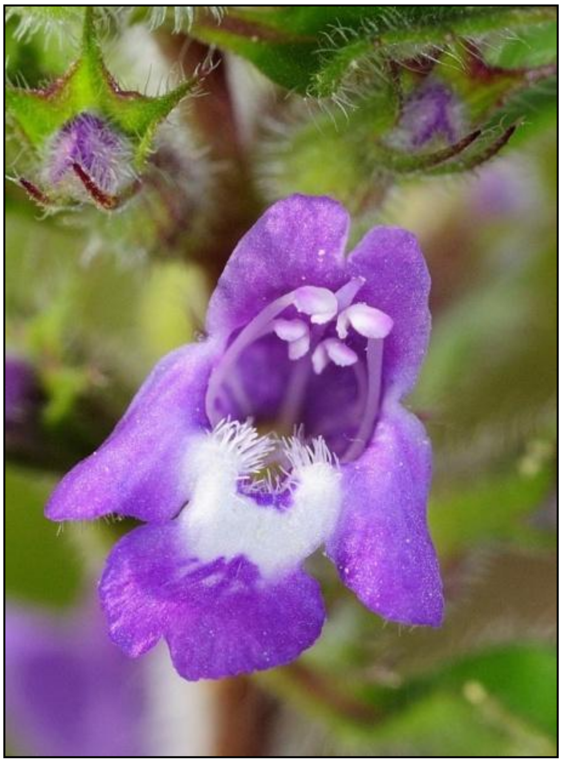
[147] Stroh, P.A. 2015. *Clinopodium acinos*(L.) Kuntze.Basil Thyme. Species Account. Botanical Society of Britain and Ireland.





Halling. Photos by Lliam Rooney, 19 June 2012

Clinopodium nepeta (L.) Kuntze (*Clinopodium calamintha* (L.) Stace) (Lesser Calamint)

vc 15 and 16

Rarity / scarcity status

Clinopodium nepeta is, in the British Isles, primarily a plant of the south east, particularly Essex and, to a lesser degree, Kent. Its historic range in east England has apparently contracted considerably, probably due to habitat destruction and changes in grassland cutting regimes (flailing of verges and close mowing of churchyards or similar habitats). This has led to it being classified as Vulnerable in Great Britain as a whole, although since adjusted to a threat status of 'Least Concern' consistent with its England ranking; but it is nationally **scarce**. In Kent, it is treated as locally **scarce** as well. It is a Kent axiophyte, indicative of good habitat.

Lesnes Abbey. Photos by Chris Rose, 3 October 2010

Account

As with Basil Thyme, Thomas Johnson's two journeys into Kent account for the first published records. In his *Iter Plantarum*, he recorded *Clinopodium nepeta* as *Calamentha pulegii odore* Lob., by the public highway between Gillingham and Sheppey on 14th July 1629. Along this route Francis Rose (in the 1972 edition of Johnson's *Iter Plantarum*) noted the species as still abundant at Key Street and Bobbing. Johnson during his second journey encountered this species on his return from Faversham, via Sittingbourne, Rochester and Gravesend on 5th August 1632. The route would have passed near localities which Francis Rose (in Johnson's *Descriptio Itineris*, the 1972 edition) also noted Basil Thyme as still present - plentiful at Key Street and Chestnut Street near Sittingbourne and, until (then) recently, along Watling Street near Norton. At Faversham, John Stuart Mill commented[148] on 'the rare *Calamintha Nepeta,* which abounds both on the turf in [Davington] churchyard, and the churchyard wall' in September 1860. He went on to say '*C. Nepeta*, covers many acres in several parts of Kent and Essex, where it is the sole herbage, excluding every other plant except grass. In some places it gives a hue to the fields where it grows, which at a considerable distance look as if full of clover'. We may consider the survival of the species at Davington churchyard (2020) as remarkable, but the existence of such quantities elsewhere in the mid 19th century is a graphic indication of the change in fortunes in what is now a somewhat marginal survivor.

Francis Rose's general assessment[149] of this species was that it was rare, but scattered along the valley- and river terrace-gravels from Abbey Wood to Faversham, where it was locally abundant, with an outlier on the Medway gravels at Leybourne. It was formerly more widespread from Charlton to Thanet.

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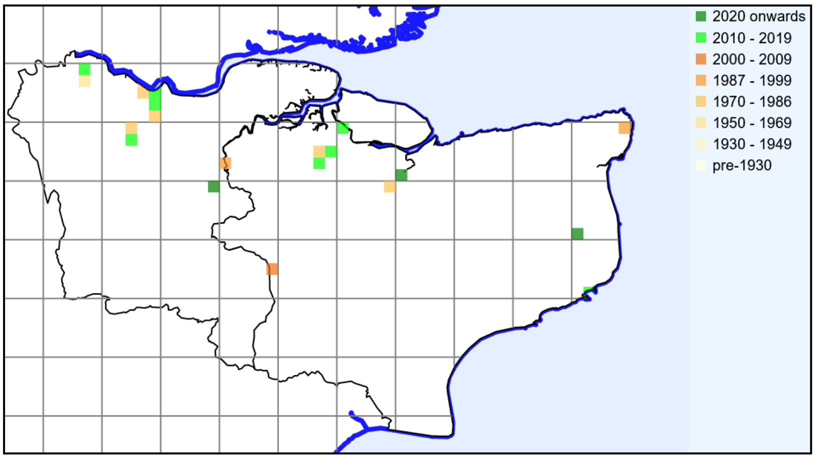
[148] Mill, J.S. (1861). Faversham Plants. An Account of a few hours' Observations in and about the ancient town of Faversham. *The Phytologist* **5**: 107-113.

[149] In his manuscript *Flora of Kent*.

Its rarity has increased since then. From 11 tetrads in the administrative county for the period 1971-80 (Philp, 1982), it was subsequently, in 1991-2005, found in only six tetrads, having appeared to have gone from some of its former sites. Several current sites have a long history of records, in addition to (possibly) Chestnut Street mentioned above, e.g. Lesnes Abbey, Greenhithe, Davington and Leybourne. Records for 2010-24 are for 11 tetrads (15 monads) and so do not provide evidence of more recent decline.



***Clinopodium nepeta* Kent records to 2024 mapped at tetrad level, from BSBI database.**

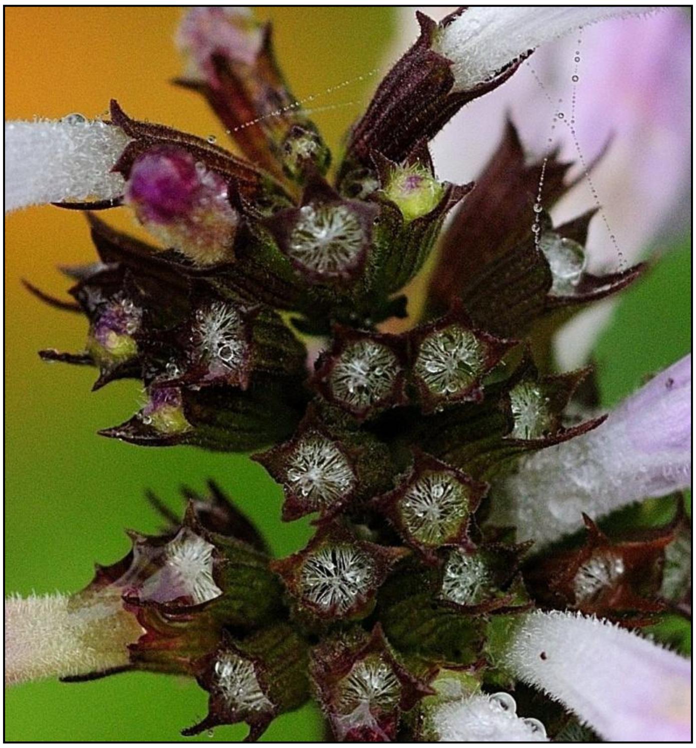
Lesser Calamint favours sunny, semi-open, south-facing banks, typically calcareous with sandy or gravelly soil. It is a short-lived perennial with a late flowering period (and hence seed-set), so that it is at risk from any mowing regime which cuts back growth without leaving time for seed-set. Semi-open conditions assist with seedling establishment, but the species can survive in more extensive vegetative cover. It may be found on roadside verges and pastures, frequently associated with *Rumex pulcher* (Fiddle Dock), which also grows in sandy / gravelly grassland. It is drought-resistant, and Francis Rose referred to it remaining fresh right through the great drought of 1959.

It may be confused with *Clinopodium ascendens* (Common Calamint), but is more branched with paler lilac flowers and with calyces that have straight, more or less equal teeth, and protruding hairs (not confined within the calyx throat).

	Grid reference	**Site status**	**Last record date**	**Recorder**	**Comments**
Lesnes Abbey	TQ47T	Managed by Bexley Council	(1) 19 August 2017 (2) 3 October 2010	(1) RMB (LNHS meeting) (2) CR	(1) On east side of gravel pit TQ 4778 7887 etc. - has increased greatly over 20 years with conservation effort. (2) Photographed in abundance on slope near Abbey. Site is also mentioned by Hanbury & Marshall (1899). Maintained by Lesnes Abbey Conservation Volunteers, e.g. reducing bramble. Bexley Council has BAP policy: "PA01-05 Manage the vegetation in and around the colony of Lesser Calamint near Lesnes Abbey (its only London site) to promote its survival and spread, including removal of encroaching trees as necessary".
Farningham	TQ5466	Owned by Woodland Trust	2 September 2019	JP	Nine Hole Wood , broad-leaved woodland on chalk, one or two plants
Farningham Road station	TQ5569		1998	RMB	TQ 5575 6929, embankment.
Stone	TQ5574		1997	JRP	TQ 577 745, churchyard.
Bluewater	TQ5972		13 July 2011	GK	Eastern Quarry, on chalk.
Greenhithe	TQ5873, TQ5874		(1) 2 October 2012 (2) After 1990 and before 2006	(1) GK (2) EGP (Philp, 2010)	(1) From TQ 58547 73943 to TQ 58563 74074, in and around chalk grassland scrubbing over, and adjoining field bank. Abundant, even in quite shady scrubbed

					areas, but in 2014-15 this area was in course of housing development (since completed). (2) Location given as TQ57X. Hanbury & Marshall (1899) mention the species as present in woods and lanes around Greenhithe.
Leybourne	TQ65Z, includes TQ6858		(1) 3 August 2023 (2) After 1990 and before 2006	(1) DC & ME (2) EGP (Philp, 2010)	(1) TQ 689 589, a tall plant by Leybourne church porch and a couple more near the church, maybe protected from mowing by a bees' nest. A few smaller plants on a couple of tombs. Not seen on churchyard walls or surrounding castle grounds. (2) TQ75Z. here is a history of records in the Leybourne area, including Hanbury and Marshall's reference (1899) to the Rev. W.M. Rogers having found it in great plenty around Leybourne Castle; and 1944 material in MNE from FR, referring to the castle and a gravelly pasture by the churchyard.
Hartley	TQ6166		25 July 2004	BW	Foxborough wood.
[Holborough]	[TQ76B]		[After 1990 and before 2006]	[EGP (Philp, 2010)]	The colony recorded as this species was revisited on 4 August 2013. It is at TQ 7104 6283, spread over an area of about 30 x 30m down by the river on old industrial land. On careful examination it appeared to be atypical *C. ascendens*, and not *C. calamintha* (DG & SP).
Blue Bell Hill	TQ7460		15 August 2004	DM & FB	TQ 7491 6085.
Staplehurst	TQ7944		2004	MH	Road-verge near bridge.
Danaway	TQ8662		14 August 2015	SB	A patch about 3 metres long on a wide grassy roadside verge at TQ 86037 62853. Obviously a known, managed site as recent mowing had avoided the plants. Also scattered plants alongside a dry roadside bank at TQ 86016 62893.
Danaway (north)	TQ8663		1 August 2018	GK	TQ 8635 6338, patch on north west slope of A249.
Chestnut Street	TQ8763		(1) 16 October 2012 (2) 2 August 1991	(1) GK (2) EGP	(1) Abundant for about 40m of roadverge and south-east facing grassy bank below, in adjoining pasture, from School Lane junction with Chestnut Street towards the Tudor Rose pub. TQ 87668 63961 to TQ 87636 63938. Well grown and flowering in pasture despite horses. Soil overlies chalk. (2) Specimen in **MNE** from the (old) A249 roadside verge. Recorded as TQ86R, but thought to be at TQ 875 638, although TQ8662 records (above) are in the same tetrad. This area has a long history of records – see above.
Bobbing	TQ8864		23 October 2012	LR & GK	Abundant along c. 45m of north side of former Bobbing Hill road (closed in relation to construction of current line of A249 and Sheppey Way) between TQ 88322 64749 and TQ 88369 64747. Numerous plants and seedlings along this stretch, both on verge and in cracks of pavement and in gutter. Probably Johnson's original

					1629 route.
Kingsferry	TQ9169		(1) 27 August 2013 (2) After 1990 and before 2006	(1) RG, LR & GK (2) EGP (Philp, 2010)	(1) TQ 91221 69163, numerous plants along slope of 15m stretch of embankment, made ground between Sheppey Way and the railway, where old and new bridges over the Swale intersect. (2) Given as TQ96E.
South of Danaway	TQ9662		14 August 2015	SB	(a) Scattered plants alongside a dry roadside bank at TQ86016 62893. (b) A patch about 3 metres long on a wide grassy roadside verge at TQ86037 62853. Obviously a known, managed site as recent mowing had avoided the plants.
Davington	TR0161		(1) 5 September 2020 (2) 31 August 2020	(1) LR & CW (2) SC & ML	(1) Frequent in Davington Churchyard, TR 01096 61776. (2) Davington, abundant in lightly managed churchyard. [Recorded here by J.S. Mill, 1860.]
Dover Castle	TR34F, TR34G	English Heritage ownership	(1) August 2015 (2) July 1994	(1) EB (2) JP	(1) TR 32619 41716, Dover Castle, on the bottom of a grassy slope next to a path and running along that area. (2) Dry banks, both tetrads.
Tilmanstone north	TR3051		8 September 2023	SC	Five plants on track TR 3063 5170.
St Peter's, Thanet	TR36Z		After 1990 and before 2006	EGP (Philp, 2010)	



At Bobbing, along the route probably taken by Thomas Johnson in 1629, when the species was first recorded for Kent. The calyx teeth characters and protruding hairs in the calyx tube distinguish it from *Calamintha ascendens* (Common Calamint). Photo by Lliam Rooney, 23 October 2012

Comarum palustre L. (*Potentilla palustris* (L.) Scop.) (Marsh Cinquefoil)

vc 15; long gone from 16[150]

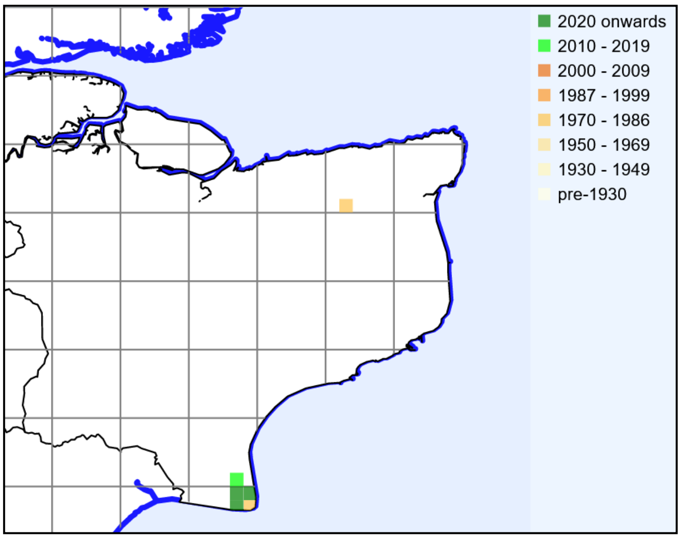
Rarity / scarcity status

Comarum palustre is common over much of the British Isles, but increasingly local or rare in central and southern England. It is not regarded as being at risk in Great Britain as a whole, and so its conservation status there is of 'Least Concern', although in England it has become **Near Threatened**. In Kent it is **rare**.

Dungeness. Photo by Geoffrey Kitchener, 15 June 2010

Account

A possible seed of *Comarum palustre* was found in a late Bronze Age context at Minnis Bay with other species of fresh-water or fen conditions[151]. As for historic botanical observations, Marsh Cinquefoil was first published as a Kent species by Daniel Cooper in his *Flora Metropolitana* (1836), representing the results of excursions in 1833-35. He noted it at Keston Mark or Common, from which there does not seem to be a record since about 1939. Hanbury & Marshall (1899) regarded it as very rare, in spongy bogs and pond borders. Its most constant (and last remaining) station is at Dungeness, where it was described by George Dowker in 1867[152] as appearing "in great profusion in the beach ponds – the only habitat I know in East Kent". Records elsewhere are old or untrustworthy, but Francis Rose mentioned in his manuscript Flora of Kent in his manuscript *Flora of Kent*, as though no longer extant, a sighting in 1952 in a dike by Lampen Wall, Stodmarsh (presumably around TR2261), found by R.E. Wood and determined by E Scott.



Comarum palustre **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Dungeness has always been the main Kent location. In an unpublished report of 1953 Francis Rose described its habitat in the Long Pits, where the two largest lakes had an extensive area of fresh water over shingle surrounded first by reed swamp of *Typha angustifolia* (Lesser Bulrush) (or sometimes *Schoenoplectus tabernaemontani* (Grey Club-rush) then landwards succeeded by floating swamp zone with *Comarum palustre* (with *Eriophorum angustifolium* (Common Cottongrass) locally as a dominant, after which wet-fen succeeded, where *Comarum palustre* was accompanied by *Thelypteris palustris* (Marsh Fern), *Carex pseudocyperus* (Cyperus Sedge), *Carex rostrata* (Bottle Sedge) and more *Eriophorum*, with a drier fen zone following landwards. The four other lakes or ponds surveyed also held *Comarum palustre* in swamp, one being choked by it and *Thelypteris palustris*.

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[150] However, a purported record was made in 2015 from Bewl Water which is unconfirmed, and the location appears unsuitable (2021).

[151] Conolly, .O. (1941). A report of plant remains from Minnis Bay, Kent. VII Data for the study of post-glacial history. *The New Phytologist* **40**:299-303.

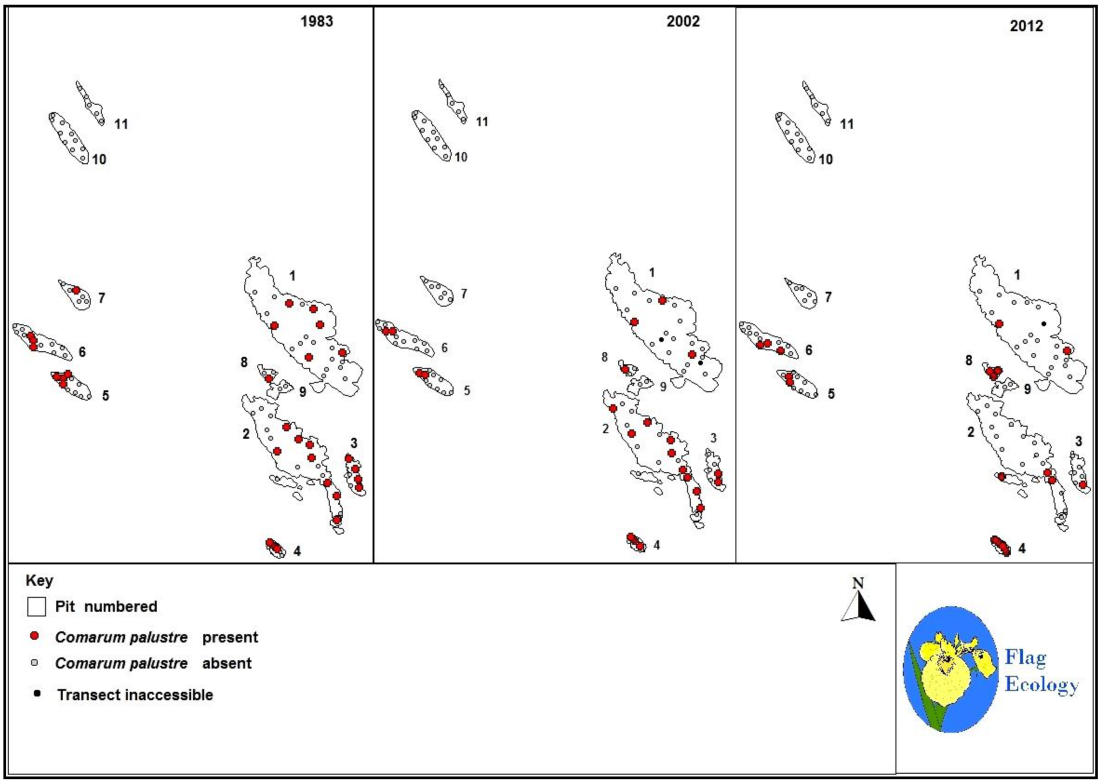
[152] *Report of the East Kent Natural History Society, Session 1867*. p.32.

Habitat at Dungeness. Photo by Geoffrey Kitchener, 15 June 2010

Comarum palustre was recorded in three Dungeness tetrads in Philp (1982) and two in Philp (2010). These more recent records were in dykes or other damp areas, hollows and about pools. A major new site was found further north by Tim Inskipp in 2013, with some 600 plants present in a wet depression lying north-south in the shingle between Lade, Lydd-on-sea and Lydd airport. Our 2010-24 records for East Kent accordingly amount to four tetrads (five monads), although the apparent increase masks a decline at the Dungeness Open Pits.

It spreads by rhizomes and may still be found straggling through *Juncus* and *Carex* spp. in permanently wet ground and floating vegetation mats at the edge of the Open Pits at Dungeness. Transects of 10 x 1 metres have been regularly surveyed there for the RSPB and the accompanying map (included by kind permission of Flag Ecology and the RSPB[153]) indicates presence/absence in the relevant transects in 1983, 2002 and 2012. Whilst the map is not a full distribution map, in the sense that it relates to the surveyed transects only, there is evidence for decline of *Comarum palustre* in this location, having only been found in 18 transects in 2012, whereas it was present in 23 in 2002 and 30 in 1983. It has disappeared from pit 7 and has become very rare in pit 3. Indeed, in the context of the transect vegetation as a whole, *Comarum palustre* lies amongst the top ten declining plants, which is a disturbing trend. Over-shading by developing *Salix* spp. appears to be a major factor.

***Comarum palustre* at Dungeness Open Pits**



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[153] Unpublished report (2013), B. Banks & B. Ferry: *Fen Vegetation Monitoring, Dungeness RSPB Reserve*.

The following data table represents records other than the survey data given above.					
Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Dungeness	TR01T, includes TR0717	SSSI, NNR	(1) 20 June 2020 (2) 10 July 2016 (3) 2012 (4) After 1990 and before 2006	(1) SL (2) KBRG meeting (3) BB & BF (4)EGP (Philp, 2010)	(1) Open Pits, TR 07513 17946. *Phragmites* bed within Open Pit 3. (2) In Open Pits 3 and 4, TR0717. (3) TR0717. (4) Recorded as TR01T.
Dungeness	TR01U, includes TR0618, TR0718	SSSI, NNR	(1) 20 June 2020 (2) 4 June 2018 (3) 13 May 2017 (4) 10 July 2016 (5) 25 July 2012 (6) 15 June 2010 (7) After 1990 and before 2006	(1) SL (2) AW (3) SL (4) KBRG meeting (5) SB (6) GK & BG (7) EGP (Philp, 2010)	(1) Open Pits, TR 07258 18140. Northern end of Open Pit 2, small area within *Phragmites* dominated open fen. (2) TR0718 (3) Dungeness RSPB Reserve, west side of Open Pit 6 (*Cladium* Pit), TR 065 183. (4) Open Pit 2, TR0718. (5) TR0618. About 20 plants at TR 06593 18353 in *Cladiu*m Pit. (6) TR0718. A colony c. 15 x 10m spreading in wet area of pit 8 where cleared of *Salix*, TR 0723 1827; also small quantity at edge of pit, TR 0745 1835. (7) Recorded as TR01U.
Dungeness	TR01Y		After 1970, before 1981	Philp, 1982	
Dungeness	TR0818	SSSI	26 June 2022	KBRG/WFS meeting	Several patches in a damp hollow at TR 085 181 with *Veronica scutellata*.
West of Lade / Lydd-on-sea	TR0720	SSSI, NNR	15 June 2013	TI	TR 07117 20887, 600 plants

Crassula tillaea Lest.-Garl. (Mossy Stonecrop)

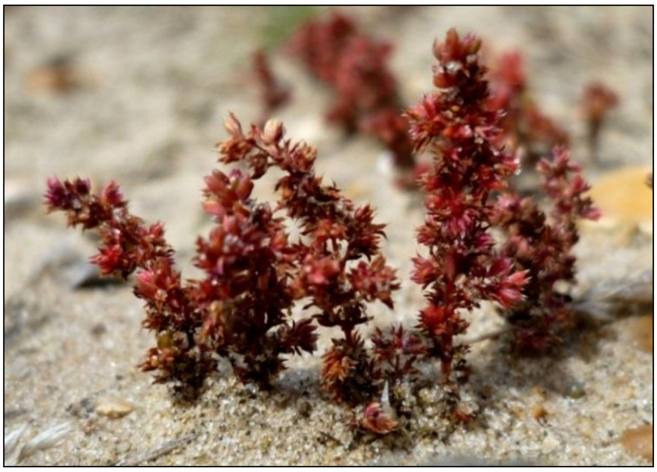
vc 15

Rarity / scarcity status

Mossy Stonecrop is not uncommon in East Anglia and Dorset and has been expanding its range generally in the British Isles, including in Scotland, so that its conservation status is generally one of 'Least Concern', both in England and in Great Britain as a whole. It may not be a native of long standing in Kent, but had been supposed to be extinct for many years. Currently its Kent status is **scarce**, with half a dozen or so localities.

Account

Early occurrences of this species in Kent are somewhat obscure. There is a specimen at Perth Museum and Art Gallery, apparently donated by Prof. J.H. Balfour (1808-84), labelled as from vc 16, London, which raises questions as to its exact provenance and status. It was also shown by Prof. Tabor to Dr. Cyril West around 1908 on a sandy track between ½ and 1 mile north of the end of Deal town, but although there is apparently suitable sandy terrain there, it has not been re-found.



Lydd Ranges. Photo by Owen Leyshon, 7 August 2012

In 2012, it was discovered by a group of botanists in the course of an exploration of Ministry of Defence lands at Lydd Ranges. The location was reminiscent of the species' Breckland habitats, a trackway passing over open, fairly bare sandy ground with planted conifers in the vicinity. *Crassula tillaea* was found scattered but frequent on the compacted shingle/sand of the trackway from its junction with a military road at TR 03785 19888 for about 100m east south-eastwards to TR 03878 19865. It was also present on compacted sand, often devoid of other vegetation, for a couple of metres either side of the trackway.

Lydd Ranges, habitat. Photo by Owen Leyshon, 7 August 2012

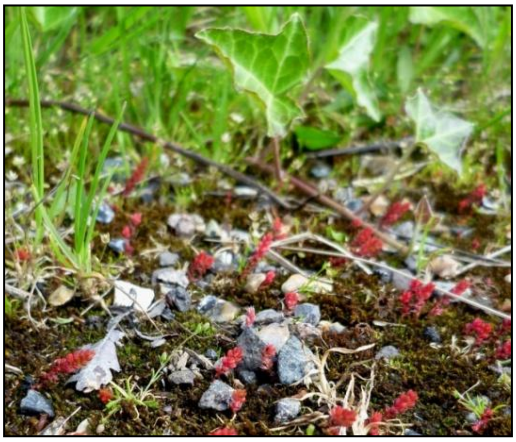
Then in June 2013, Owen Leyshon found on the dirt edge of Galloways Road which runs alongside Lydd Ranges, thousands of plants extending from (south) TR 03978 19758 for at least 450m to TR 04218 20178 (north towards Lydd), and present also in the fishermen's car park on the lake side (TR 04019 19794) of the road. This population appears very likely related to that found in 2012. They are only 140m apart and although they are currently separated by security fencing, it is possible that vehicles may have passed from one location to the other when conditions permitted. The only normal use of the Lydd Ranges location would be for the passage of military vehicles. Whilst the plant may be native here, given that it could have long been overlooked due to access restrictions (albeit that Galloways Road is not subject to the same restriction level as the fenced-off ranges), there is a strong possibility that seed may have arrived with military vehicles from East Anglia or Dorset.

A series of finds followed in various East Kent sites:

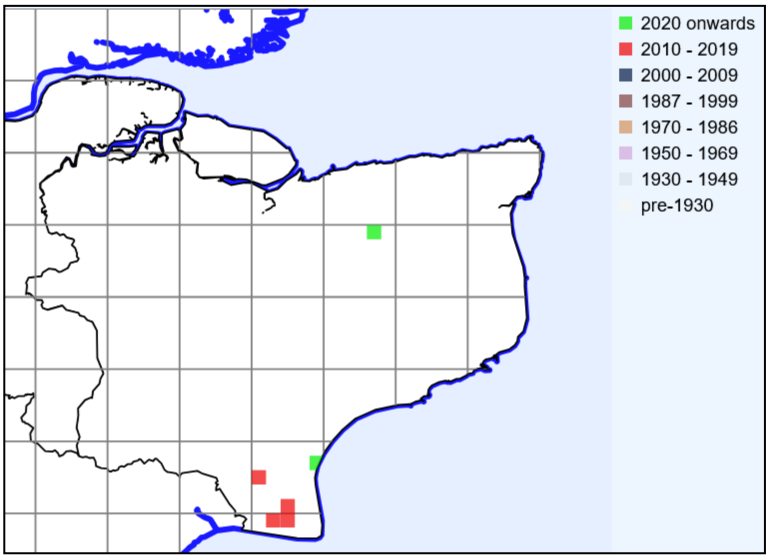
(1) In Millbank Lane, south west of Old Romney, some three hundred plants were discovered on 11 May 2014 by Owen Leyshon. These stretched for about 10 metres, between TR 01964 24994 and TR 01949 24983, in a dried up puddle/depression at the largely disused lane. The site is close to a new solar panel farm, but this does not offer any obvious clues as regards origin.

(2) The next finds, on 26 April and 1 June 2022, by Sue Buckingham and Colin Osborne have similar characteristics to those at Lydd, in that they were found on dry gravelly and sandy tracks at Chequer's and Old Park SSSI, Canterbury, an area which was used for many years by the Ministry of Defence for training, so that there is common link of the nature of the habitat and its use by military vehicles. Plants were seen at TR 16968 58948, TR 16964 58920, TR 16986 58786, TR 17324 58998 and TR 1727 5890. These were supplemented by a record by Richard Moyse on 10 May 2023 at TR 1674 5875 and another by Alex Lockton and others on 1 June 2024 at TR 1640 5844 . It is likely that the same origin as with Lydd Ranges applies.

(3) On 22 May 2023, David Steere found plants carpeting a track at Littlestone golf course on sandy consolidated shingle ground at Littlestone Warren, TR 086 262. The likelihood is that these arrived as seed or fragments on footwear and, given that Mossy Stonecrop is being recorded increasingly on commons, car parks and places of public resort, including in Surrey and Hampshire, there will be opportunities for transfer.



Near Old Romney, habitat. Photos by Owen Leyshon, 11 & 16 May 2014



***Crassula tillaea* Kent records to 2024 mapped at tetrad level, from BSBI database**

Our 2012-24 records amount to six tetrads (seven monads) and this spread accords with recent expansion of distribution generally in the British Isles, which *Plant Atlas 2020* mentions as presumably occurring as a result of milder winter weather combined with the accidental transport of seeds and vegetative fragments on shoes and vehicles.

Mossy Stonecrop is a minute annual which would be at risk of over-shading by any other vegetation and so prefers open terrain. Its affinity for compacted ground is probably related to the assistance given to autumn germination and establishment by retention of water in what, but for the compaction, would otherwise be a free-draining substrate.

Lydd Ranges. Photo by Sue Buckingham, 7 August 2012

Crepis foetida L. (Stinking Hawk's-beard)

vc 15 (having been considered extinct); long gone from 16

Rarity / scarcity status

Crepis foetida is considered to be an archaeophyte, or ancient introduction, and had been regarded as extinct in the wild in the British Isles since 1980. It is likely, however, that its extinction was not total in Kent, and that there is a surviving colony, so that the species continues as being extremely **rare** in Kent and nationally. It is treated as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006 and is protected from picking under Schedule 8 of the Wildlife and Countryside Act 1981 . **Its status is Critically Endangered in both Great Britain as a whole and in England and visitors to the current site are asked to tread carefully. Young plants are inconspicuous and have been damaged with stems snapped through trampling in search of the species.**

Account

Population trends

The Stinking Hawk's-beard formerly possessed a scatter of records in the county on well-drained substrates, either on chalk or gravel / shingle.

The first published record is that of Blackstone in his *Specimen Botanicum* (1746), in which he refers to the Small rough Succory-leaved Hawkweed at Northfleet Chalk-pits. Other early records give the species along the North Downs from Knockholt to Wrotham and on the chalk exposures of north west Kent (e.g. Charlton chalk-pits, Greenhithe, Gravesend chalk-pits). The chalk-pit occurrences are suggestive that disturbance may have accompanied a bare, well-drained, nutrient-poor habitat. These chalk-related records barely continued into the 20th century, although W.H. Griffin found the species in 1903 on waste ground above Swanscombe Marshes (there were chalk workings in this area, also)[154].

Lydd-on-Sea. Photo by Brian Banks, 7 July 2010

In contrast, East Kent occurrences have mostly related to growth on gravel or shingle. *Crepis foetida* was especially known in the 19th century from the coast between Deal and Kingsdown, J.T.B. Syme recording it as abundant on the shingle between Walmer Castle and Kingsdown and collecting it there at least from 1860. Records just continued into the 20th century: Marshall still regarded it as present when writing his botany account for the *Victoria History of the County of Kent* (1908). Similarly, there was then extant a site by the shore at Hythe from which material was collected in the 19th century. This may well have been the shingly terrain now occupied by Hythe Ranges. The Hythe site, in terms of habitat and location, appears closest to the Dungeness area, which was (and it seems, still is) the last stronghold for the species, both nationally and in the county.

Dungeness was not recognised as a site for Stinking Hawk's-beard by Hanbury & Marshall (1899); and although most records are from the 1940s onwards (albeit recorded in 1932), there does not seem to be any substantive reason for supposing that it had not been long established there. The plant was well-known from some limited spots in the extensive shingles of Dungeness, although one of the difficulties of communicating its situation before the availability of GPS tracking equipment was the lack of landmarks. This may have obscured the distinctness of some of the records and attention being given to the plant's decline. The first edition of the *British Red Data Book* (1977) refers to over 400 flowering plants having been recorded in one

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[154] *A Survey and Record of Woolwich and West Kent* (1909), general eds. C.H. Grinling et al.

Kent colony in 1969, with only two plants being seen in 1970. There is also a sequence of records from a colony in TR0916, with Francis Rose having seen over 60 plants in both 1952 and 1953; down to 20 in 1976 (Eric Philp) and two plants (1980, Eric Philp, N. Riddiford and P. Horton). A further record in 1980 at TR 093 182 (Eric Philp and P. Horton) was regarded as related to this colony. The last records before the species was treated as extinct in the wild in the British Isles appear to have been these from 1980 and another made that year by L. Breda Burt at TR0917: "five plants, between the road and the bungalow of the elderly lady who breeds dogs. Plants used to be by the garden path in front of the bungalow and near the corner of the concrete blockhouse". There was also an unconfirmed 1981 record attributed to B. Hawkes somewhere north of the old Dungeness station. By the time that Rosemary FitzGerald took stock of the position in 1987, following abortive searches in 1985 and 1986, the species appeared to have vanished: "Being so well known, and so taken for granted, there were no questioning eyes watching its progress".[155]

Lydd-on-Sea. Photo by Lliam Rooney, 20 June 2012

Reintroductions

Following the apparent extinction of *Crepis foetida*, various attempts were made to reintroduce the species, a thorough account of which is given by Brian Ferry *et al*. (2010)[156]. Using Dungeness seed held at Cambridge University Botanic Garden, pot-grown plants and seed were planted at the RSPB Dungeness reserve and in nine gardens at Dungeness village in autumn 1992. Following rabbit-grazing, a renewed attempt was made in autumn 1993, protecting plots with wire cages. Plant numbers peaked at around 250 in both areas in 1995-96, although in general plants did not spread more than seven metres from the cages, and there is little in the way of record of continued presence from 2001 onwards. Only one Dungeness village property appears to retain the reintroduced Stinking Hawk's-beard, and this is after a number of unsuccessful reintroductions there. It is a partly shaded location on shingle modified by content of sand, soil and crushed concrete, where about 40 plants have appeared regularly as at 2012 and domestic pets deter rabbit-grazing. In September2008, introduction plots with rabbit-proofed fencing were set up near the RSPB visitor centre, but although plants appeared in 2009, none succeeded in 2010 or subsequently; and an introduction site at Boulderwall farm held plants in a fallow field (at TR 06043 19809) which has since reverted to permanent pasture and is infested by rabbits, which are destructive to Stinking Hawk's-beard.

In 1998 Stinking Hawk's-beard was made a priority species under the UK Biodiversity Action Plan, with a target to reintroduce it by 2003, either to its original sites or to alternatives. In 2000 it was reintroduced to Rye Harbour in East Sussex and in 2003 pot-grown plants were planted out at three chalk pits in north Kent (bearing in mind the early Kent records from this type of habitat). The chalk pit plantings gave rise to small populations which, however, had died out by 2008. The Rye population expanded considerably following the installation in 2005 of fencing to exclude rabbits; and a population in Northiam, East Sussex also developed following garden cultivation. The species' current status as a reintroduced plant more or less rests on the East Sussex populations, given the lack of success of the Kent reintroductions other than at the one property mentioned above.

Rediscovery

In July 2010 a visitor to a bungalow at Lydd-on-Sea, Dave Walker, suggested that the species was present there (it had been missed by many visiting naturalists previously). The occupier of the property, Dorothy Beck, recognised it as the source of an odour which had accompanied gardening operations for some time and which she connected with the sward, and indeed the white pappus clocks had been familiar as a regular occurrence in recent years. It transpired that the plant was present within the garden of the property, and was particularly abundant in frontage grassland outside the garden wall. This distribution also appeared to apply in relation to the similar adjoining property.

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[155] R. FitzGerald (1987): Crepis foetida L. Stinking Hawksbeard. Unpublished NCC report.

[156] B. Ferry, B. Banks, J. Sears & C. Sculley (2010): Stinking Hawk's-beard – a reluctant candidate for Species Recovery. *British Wildlife* 21(4): 255-260.

Lydd-on-Sea, habitat. Photo by Brian Banks, 7 July 2010

There is no suggestion that the species has been deliberately cultivated here: Dorothy Beck had occupied the property for the previous 7 years and knew the previous owner, first visiting some 35 years before. It is not possible to rule out that the reintroductions at Dungeness might have spread through wind-borne seed to this location, but this is relatively improbable in view of the limited success of the reintroductions and their distance (1.4km to the south east in the case of the Dungeness estate, from 2 to 2.7km to the south west in the case of the RSPB reserve) in comparison with historic natural occurrences. There was formerly a natural population recorded some 440m to the south west, at the old railway and rail halt at Lydd-on-Sea. Also, the species was reported by the RH&D railway some 50m away in 1989, although Eric Philp was then unable to confirm presence, despite search. Plants have been found growing by the railway line between 2010 and 2012, 60 to 70 metres distant from this point. The likelihood is that the present colony is a survival from a population related to these records, rather than a spread from the reintroductions. An unconfirmed report around 2005 of a few plants in an unidentified garden just over 1km north may also relate to the railway corridor, but falls short of providing further evidence.

At the bungalow in 2010, 46 plants were counted by Brian Banks in the front and rear gardens and the drive; and at least 1811+ plants were counted on the frontage plot. The adjoining frontage plot to the south was not then surveyed, but several hundred plants appeared to be present.

A count at the bungalow in 2011 of 229 plants was considered an underestimate, as many small annuals flowered later after rainfall.

On 23 August 2012, the total recorded by Brian Banks was at least 351 plants, of which 228 were on the frontage plot. In addition, several hundred plants were estimated as present on the adjoining frontage to the south. One plant present in June 2012 on roadside shingle west of Pleasance Road could not be located in August. Also, he found a patch of 16 plants growing close together by the railway to the north of the bungalow, apparently representing seedlings from eight plants here in 2011. It is not yet clear whether this railway-related population (which grows on modified shingle with fine material intermixed, as with the bungalow frontage plot) represents a self-sustaining population or short-term colonists from the bungalow site. However, given the other railway-related sightings mentioned above, there appears to have been some historical continuity for appearances in this sort of habitat in this general locality. On 8 July 2019, Owen Leyshon considered the population here to comprise thousands of plants.

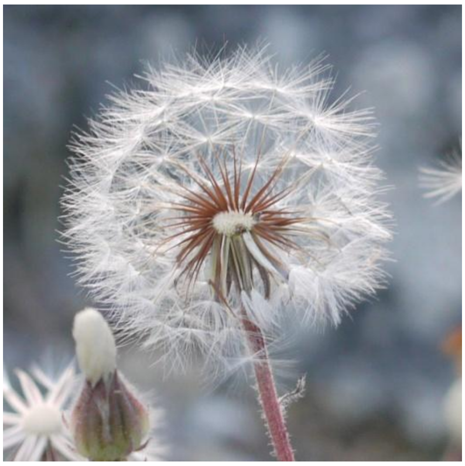
Lydd-on-Sea. Plants (circled) in their RH&D light railway trackside habitat, where relatively uncommon. Photo by Brian Banks, 18 August 2011

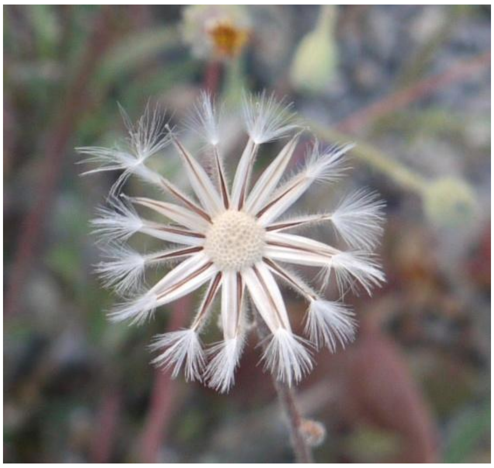
Associated flora recorded by Geoffrey Kitchener in 2012 at the bungalow was indicative of consolidated shingle with sufficient fine material and nutrients to maintain a sward: species included *Achillea millefolium, Anisantha sterilis, Anthroxanthum odoratum, Arenaria serpyllifolia, Bromus hordeaceus, Cerastium glomeratum, Cynosurus echinatus, Daucus carota, Echium vulgare, Festuca rubra, Holcus lanatus, Hordeum murinum, Lolium perenne, Papaver rhoeas, Plantago lanceolata, Poa humilis, Sedum album, Sherardia arvensis, Sonchus asper, Trifolium scabrum, Trisetum flavescens, Vulpia bromoides*.

The maintenance regime for the northern frontage plot comprises scarifying in September to remove vegetation; the southern frontage plot is mown and raked. Additional areas of nearby roadside habitat have been scarified from 2010 onwards in order to encourage the plant to spread naturally, with no success as at 2012.

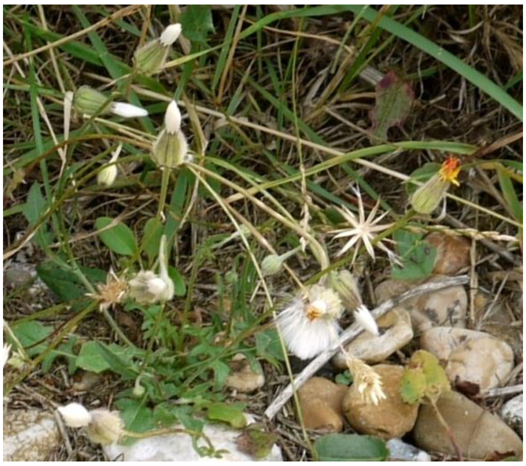
Characteristics

There are four features of the Stinking Hawk's-beard which may especially help pick it out from other yellow flowered members of Asteraceae. The first is its smell, when leaves are crushed or cut, which was described by Hanbury and Marshall (1899) as resembling bitter almonds. It might as aptly be described as medicinal, resembling antiseptic (e.g. TCP). However, not everyone is able to detect any odour. Dorothy Beck has found that the maximum level of odour appears to be present when the ground is moist and the young plants are growing vigorously (but so is everything else, so that they may still resist discovery on a hands-and-knees search). The second feature is the distinctive nodding buds. The third is the distinctively white pappus clock of the plant when in seed, noticeable both when fully expanded or when, resembling a small, soft white paint brush, it is contracted. The fourth is the differing shape of the achenes. Those in the centre of the receptacles are long-beaked and are dispersed by the wind. Those around the outer edge of the receptacle are short-beaked and remain attached to an involucral bract once the remaining seed has dispersed; they are a good way to confirm the identity of dead plants after flowering.





Long-beaked achenes (left) and short-beaked achenes. Photos by Brian Banks. (These are taken from plants outside Kent.)



Lydd-on-Sea. Photo by Brian Banks, 18 August 2011

When in flower and not in fruit or in bud, the species might well be passed over as yet another *Leontodon*- or *Hypochaeris*-like plant, and its general inconspicuousness is increased by the flowers closing around mid-day. When this happens, the flower colour changes from yellow, so as to take on a more orange tinge (see illustration, which also shows the brush-like seeding heads). Dorothy Beck has noted the plant as frequently 'hiding up' on the north side of walls or of larger plants such as *Centranthus ruber*, for moisture or shade, and only emerging to view when a flower head or seed head makes an appearance. This increases the difficulty of making an accurate survey.

Ecology

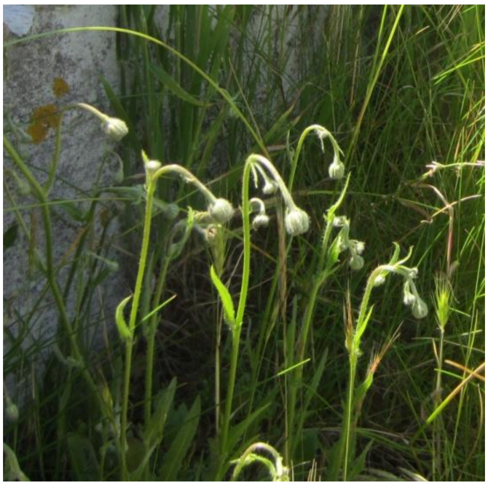
The ostensible extinction of *Crepis foetida* gave rise to questions regarding the plant's ecology, and what factors may tip the balance between survival and decline. The reintroduction programme has led to a greater understanding of these factors.

Seed production and viability do not seem to be an issue. Brian Ferry has pointed out[157] that viable seed is produced readily by plants in the field and that satisfactory germination rates have been achieved in the laboratory and in field experimental plots. A need for disturbed conditions is supported by failure of the plant to thrive on undisturbed shingle at Dungeness and Rye, and the frontage lawn scarification and raking at the Lydd-on-Sea location has evidently been effective. Ferry *et al*. (2010) summarise the negative factors affecting the species' survival as follows:

- heavy rainfall in July-September (resulting in poor germination);
- grazing by invertebrates, mainly slugs and snails (killing off plants in winter);
- drought, either immediately after germination in July-September or when buds start to form in May-June;
- rabbit grazing, especially during flowering period, May-August. The Rye Harbour re-introductions have been particularly effective when fresh ground has been made available, with rabbits excluded. Brian Banks points out that when a rabbit got into the fenced enclosure at Rye in 2012, the *Crepis foetida* population crashed to 50 from 1546 plants in the previous year. Rabbits are not present at the Lydd-on-Sea site, and hares are only occasional. Ferry et al. (2010) surmise that the earlier history of *Crepis foetida* at Dungeness may, particularly pre-myxomatosis, have been affected by local factors limiting rabbit populations which would otherwise decimate the plants. Local interviews recorded in Ferry & Beck (2004)[158] indicate that rabbit-catching was frequent and often profitable. Rabbits may also have been deterred from the vicinity of properties with pets: it may not be coincidence that one of the old sites researched by Rosemary FitzGerald was said by local botanists to be "by the barking dog bungalow".

The positive factors affecting survival are:

- the control of rabbits;
- the presence of open ground or short turf into which seedlings can establish without overshading;
- where the substrate is shingle, the presence of a mixture of fine material such as sand or soil, which renders it more moisture-retentive (the formation of such a mixture in front of the bungalow site may owe much to the spreading of domestic ash here by the former occupier and his neighbour);
- enough nutrient enrichment to encourage plant growth, but not so much as to encourage coarse vegetation;
- cold winters discouraging slugs and snails;
- warm spring-time weather encouraging rapid growth of rosettes, reducing mortality by slugs and snails.



Young plants by wall at Dungeness, with characteristic nodding heads. Photo by Geoffrey Kitchener, 20 June 2012

There is also a more general issue as regards habitat change at Dungeness, from pre-1960 and particularly pre-war, as discussed in Ferry & Beck (2004). The cessation of grazing and the reduction of inhabitants' passage generally over the shingle (as distinct from defined roadways) may be factors in the increase of coarse vegetation. The extent of potential habitat which meets the positive factors cited above for the survival of *Crepis foetida* will have decreased accordingly.

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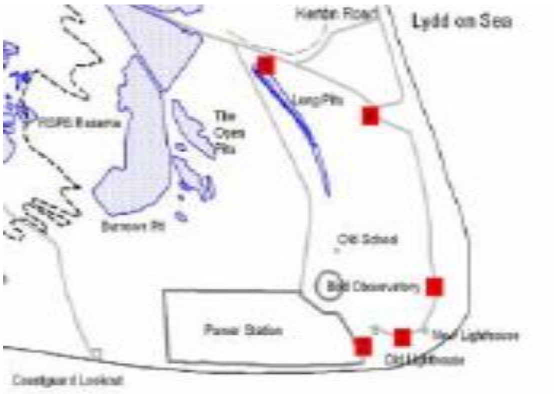
[157] B. Ferry*: Crepis foetida* L. (Asteraceae), in e.d M.J. Wiggington, (1990) British Red Data Books 1 Vascular Plants, Joint Nature Conservation Committee, Peterborough.

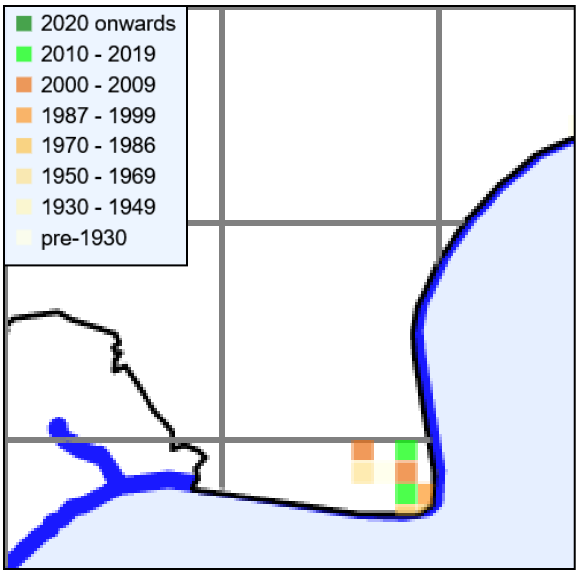
[158] B. Ferry & D. Beck (2004). Dungeness before 1960: the landscape and the people. English Nature Report no. 571.

Historic Dungeness records

The decline in the occurrence of Stinking Hawk's-beard at Dungeness up to the 1980s is discussed under "Population trends" above. In this section, more detail is given about the historic records.


Kerton Road
Lydd on Sea
Long Pits
RSPB Reserve
The Open Pits
Burrows Pit
Old School
Bird Observatory
Power Station
New Lighthouse
Old Lighthouse
Coastguard Lookout

Historic Dungeness sites, based on mapping given in English Nature Report 571, copyright English Nature


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

***Crepis foetida* Kent records to 2024 mapped at monad level, from BSBI database. The northernmost green square is record of a reintroduction site.**

Site	Grid reference	Site status	Last record date	Recorder	Comments
Dungeness	TR0718	SSSI	[undated – given in EN report compiled 1980]	n/k	Located near the Open Pits; population said to have been fluctuating yearly and possibly declining. Grid reference given as TR070180, which may not be accurate unless the Burrows pit had not then been excavated.
Dungeness	TR0816		1970s	BS	There were records for about 3 years by the power station east boundary – see lowermost red square on map. Natural England data give a grid reference of TR 082 169, but this appears incorrect.
Dungeness	TR0817	SSSI	1981	BH	c. TR 086 175, near old railway station, unconfirmed.
Dungeness	TR0818	SSSI	1953	FR	See uppermost red square on map. TR 080 188, a disturbed shingle area adjacent to the artificial 'long ponds' of Denge Beach. The plant occurred at a disused railway siding used for moving shingle, recorded

					from 1947. *Vicia lutea, Lactuca saligna, Barbarea verna, Centranthus ruber, Crepis capillaris* and *C. vesicaria* have been recorded here.
Dungeness	TR0818	SSSI	1946	RWD	See red square on map near coast east of Long Pits. At the road junction just west of The Pilot, presumably c. TR 088 185.
Lydd-on-Sea	TR0819	SSSI	2010-2012	BB	Data for this, the surviving non-reintroduced site, are given in main text, TR 0880 1927.
Dungeness	TR0916	SSSI	(1) 1980 (2) 1980	(1) EGP, NR, PHo (2) EGP, PHo	(1) Presumably the same as FR's records from 1952 to 1970 between the Britannia Inn and the old lighthouse. Down to 20 plants in 1976 (EGP) and two in 1980. On the map, this is the second lowest red square. Presumably c. TR 091 168 or TR 092 168. (2) TR 093 182, treated as related to the preceding colony.
Dungeness	TR0917	SSSI	1980	LBB	Five to ten plants by the Oasis, 1978 and 1980, TR 093 171 (the "barking dogs bungalow" site). See easternmost red square on map.

Dungeness village, former re-introduction site. Photo by Owen Leyshon, 1999

This account has benefited greatly from the assistance of Brian Banks, Brian Ferry, Dorothy Beck and Owen Leyshon.

Cruciata laevipes Opiz. (Crosswort)

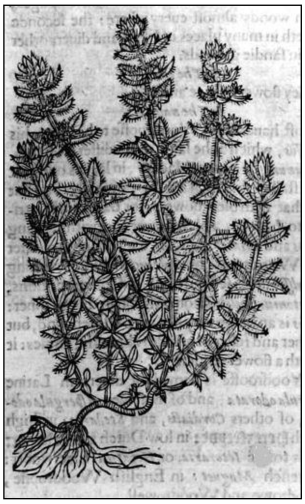
vc 15 and 16

Rarity / scarcity status

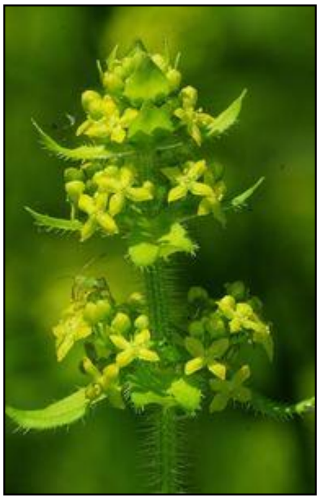
Crosswort is not uncommon in Great Britain as far north as central Scotland, although more sparse in parts of the west and introduced in Ireland. It is not regarded as being particularly at risk in Great Britain as a whole (the risk being designated as of 'Least Concern'); but in England there is some evidence of decline, and it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 22% in the likelihood of recording the species. In Kent, it is neither rare nor scarce, but Philp (2010) shows a decline in tetrad records of 32% over those given in Philp (1982), although this appears to be overstated. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first published record of *Cruciata laevipes* for Kent is given in John Gerard's *Herball* (1597), where it is stated that Crossewoort 'groweth in the lane or high way beyond Charleton, a small village by Greenwich'.



From Gerard's *Herball*, 1597.



Wye Crown. Photo by Lliam Rooney, 4 June 2010

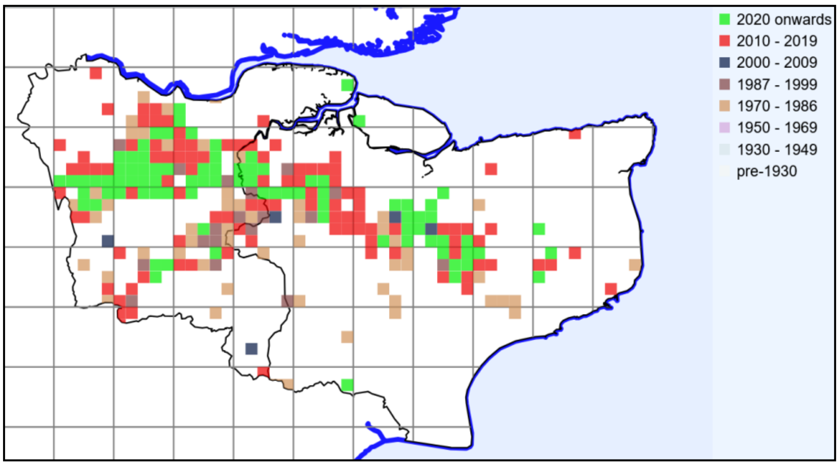
Early authors have not always noted Crosswort in the county; but Thomas Forster (*Flora Tonbrigensis*, 1816) regarded it as not uncommon in bushy places and hedges in the neighbourhood of Tunbridge Wells, and Daniel Cooper remarked on the species as present at Dartford Heath and Keston Common (*Flora Metropolitana*, 1836). None of these localities (on sand or wealden clay) is particularly typical of the species' habitat preferences, as Hanbury & Marshall (1899) considered it as to be found especially on chalk, although common and widely distributed across the county on hedgebanks and in thickets. Francis Rose described it as a native of grassland and scrub, roadverges and hedgebanks on calcareous and other base-rich soils: abundant on the chalk and ragstone, occasional on soils derived from other strata, as far east as Wye, Monks Horton; very rare in or absent from most of NE Kent.

Wye Crown. Photo by Lliam Rooney, 4 June 2010

In the 1971-80 survey (Philp, 1982), it was found in 201 tetrads, and so remained fairly common. This, however, was primarily on the chalk of west and central Kent, the species becoming scarce or absent on the chalk in the east, but there was also a concentration along the Medway valley. It was difficult to account for this distribution when Crosswort could not be found in what appeared to be localities as suitable as those in which it was present. In the 1991-2005 survey (Philp, 2010), the same basic pattern is traceable, with *Cruciata laevipes* being found in woodland edges, open scrub, rough grassland and roadside banks on the chalk generally, and in similar habitats (plus river banks) along the Medway valley – with only occasional records elsewhere. However, the number of tetrad records has plummeted from 201 to 137 between surveys.

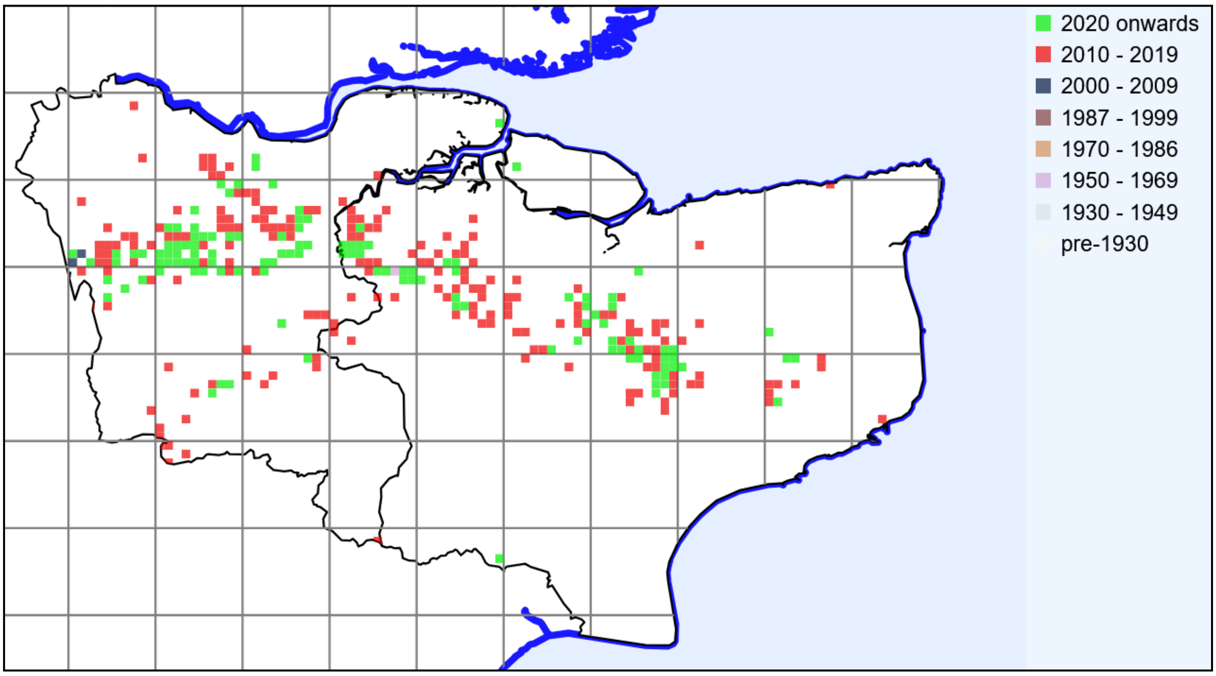
This decline is not fully borne out by subsequent records, which give 185 tetrads (312 monads) for 2010-24, although if one excludes Greater London vc16, since Eric Philp's surveys did not cover this, then the tetrad total is 171, a decline of 15% from the 1970s.

Cruciata laevipes **Kent records to 2024 mapped at tetrad level, from BSBI database.**



Losses seem proportionately a little higher off the chalk, in the Weald. It is not immediately apparent what may have caused this limited general decline. The *New Atlas of the British and Irish Flora*[159] notes that, although characteristic of older and relatively undisturbed habitats, Crosswort is able to colonise roadside and river banks; so that a loss of existing habitat might be capable of compensation in some degree. Some Kent records are for the odd plant, which may be the beginnings of colonisation; in established areas we have noted it in thousands. The response of *Cruciata laevipes* to climate changes entailing drier summers but wetter winters would appear to be mixed. Dunnett *et al.* (1998)[160] indicate that growth would be retarded by the former and promoted by the latter.

Cruciata laevipes **Kent records to 2023 mapped at monad level, from BSBI database.**



A fuller understanding of the density of current records may be obtained from the higher resolution of monad recording, as given above. Older records are fewer, as monad recording was unusual before 2010.

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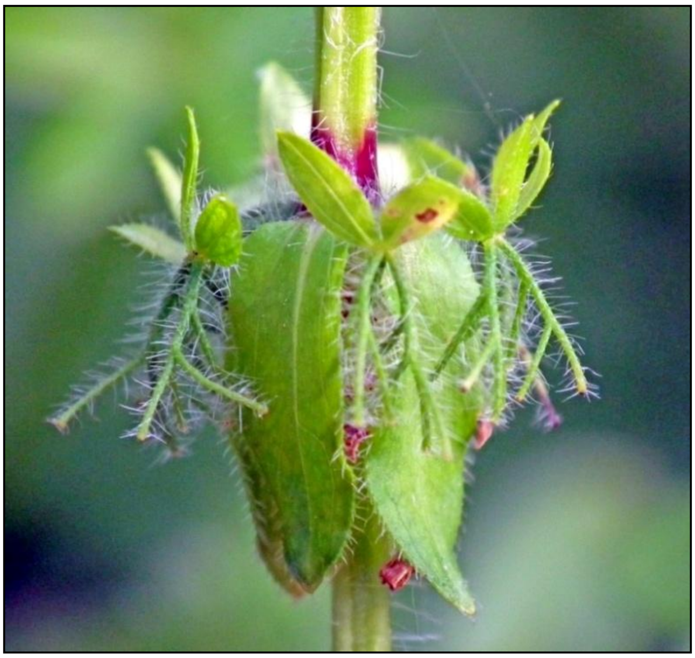
[159] Preston, C.D., Pearman, D.A. & Dines, T.D., 2002.

[160] Dunnett, N.P., Willis, A.J., Hunt, R. & Grime, J.P (1998). A 38-year study of relations between weather and vegetation dynamics in road verges near Bibury, Gloucestershire: *Journal of Ecology* **86**: 610-623.

Magpie Bottom, habitat. Photo by David Steere, 1 June 2014

Cruciata laevipes is a perennial and fairly shade-tolerant, its habitat preferences being for locations with both sun and shade; it may grow with a scrambling habit through other vegetation.

It is not readily confused with any other British species.



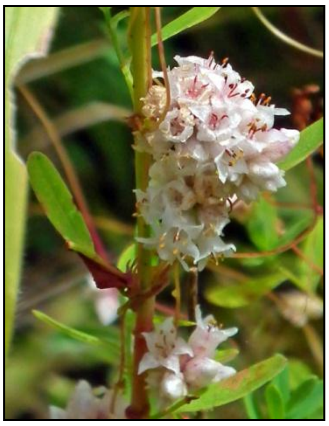
Kemsing, after flowering. Photo by David Steere, 21 June 2015

Cuscuta epithymum (L.) L. (Dodder)

vc 15 and 16

Rarity / scarcity status

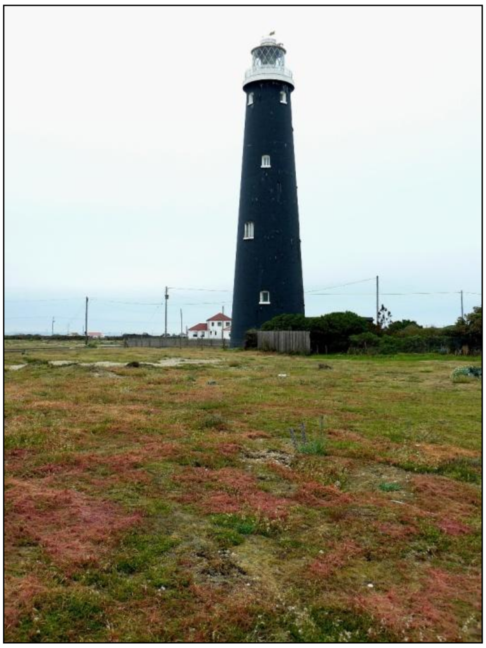
Dodder is in the British Isles mostly to be found in southern England. Distribution in the Midlands, Wales and Ireland is limited, and its former presence in northern England and Scotland has receded. In both Great Britain as a whole and in England it is regarded as **Vulnerable** and so facing a risk of extinction in the wild. In England this risk assessment is based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 35% and its area of occupancy had declined so that there was a 38% reduction in the likelihood of recording the species. In Kent, it is not common and Philp (2010) shows a decline in tetrad records of 45% over those given in Philp (1982) – calculated over a different period, of course, but seemingly more serious than the national position. However, this decline has not been borne out by subsequent recording. It is a Kent axiophyte, an indicator of good habitat.



Polhill Bank. Photo by David Steere, 4 August 2014

Account

In Kent, the first record of *Cuscuta epithymum* is a matter for conjecture for, until J.E. Smith's *English Botany* (vol. VI, 1797), English botanists confused this species with *Cuscuta europaea* (Greater Dodder). Thomas Johnson recorded a dodder in his *Descriptio Itineris* (1632) between Margate and Nash. Francis Rose fairly said (in the 1972 translation of Johnson's book) that this could have been either species. Hanbury & Marshall (1899) assigned that record to *C. europaea* and gave the first record for *C. epithymum* as by John Parkinson in his *Theatrum Botanicum* (1640), in which he writes of finding it 'upon the grasse…on Black-heath in Kent, on the very ground, not rising an inch or two high, being red'. This indeed sounds very likely to have been *C. epithymum*: the other species is, at least now, more likely to be found on nettles and near rivers.



Dungeness, shingle habitat. Photo by Heather Silk, 5 June 2011

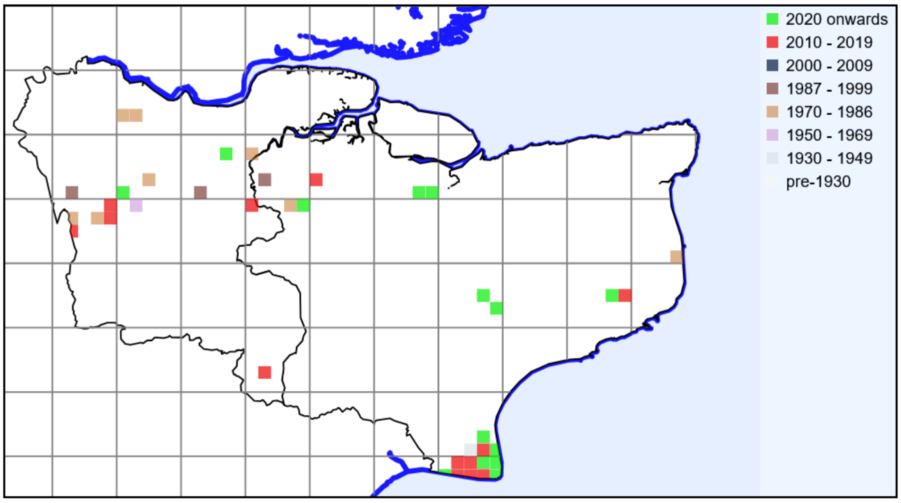
Hanbury & Marshall (1899) assessed the species as locally plentiful on heaths, etc., parasitical chiefly upon *Calluna vulgaris* (Heather) and *Ulex europaeus* (Gorse). Hence there are records for the sandy and gravelly ground of the north west Kent heaths and commons – on *Calluna* at Greenwich Park (1790); at Keston Heath (1837); and at Hayes Common (1838). A similar habitat would have been afforded by Tunbridge Wells Common (1816); Hothfield Heath (where abundant, c.1830-32); Willesborough Lees (upon furze, 1829); Pendenden Heath (on *Ulex*, 1839). Hanbury and Marshall's correspondents also supplied records for St Paul's Cray Common (probably 1887) and Fawke Common. A different habitat is indicated by records from around Rochester and between Wye and Boughton Aluph, where it is more likely that chalky terrain was involved. A third habitat is indicated by reference to George Dowker's observations at Dungeness published in the East Kent Natural History Society's Transactions (1867) in which *Cuscuta epithymum* is recorded on *Ulex europaeus*; Hanbury and Marshall supplement this by their own observations that it also grew on *Teucrium scorodonia* (Wood Sage) on the shingle.

By the time of the 1971-80 survey published in Philp (1982), much of the breadth of this distribution had been lost (although the north west Kent heaths and commons were largely outside the scope of that work, lying in metropolitan vc16), and the species was noted as present on heaths, downland and shingle beaches as a parasite on *Teucrium*, *Ulex* and occasionally other plants, being rather local and scarce except on the Dungeness shingle. The 22 tetrad records in Philp (1982), however, had reduced to 12 by the 1991-2005 survey (Philp, 2010), attributed to loss of habitat, and over half of these surviving tetrads constituted the Dungeness population.

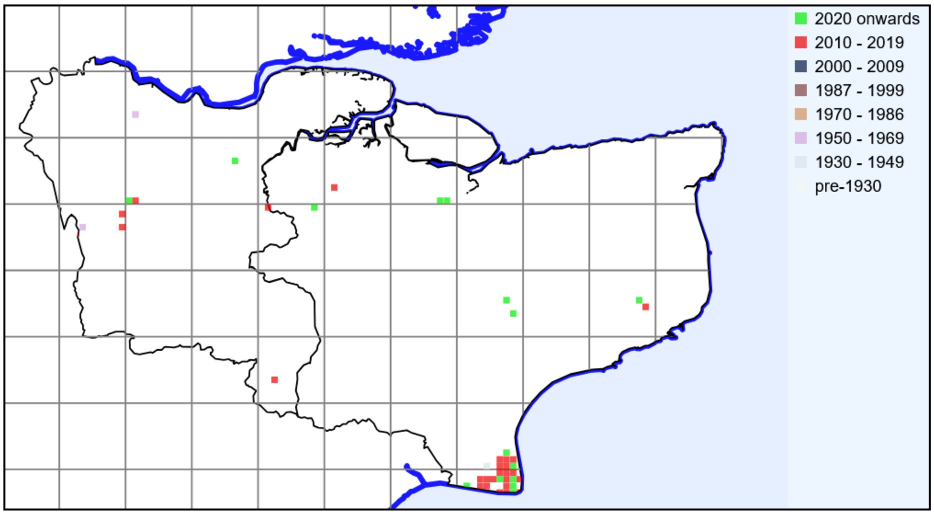
Polhill Bank. Photo by David Steere, 4 August 2014

Our 2010-24 records, however, amount to 27 tetrads (42 monads) and do not suggest decline, although there are a number of sites in West Kent and the Medway Gap which no longer have recent records. The pattern of these is best viewed at tetrad resolution, as given immediately below. At least some of these older sites represent chalk grassland still present and apparently suitable.

***Cuscuta epithymum* Kent records to 2024 mapped at tetrad level, from BSBI database.**



The density of current distribution is given more fully in the second map, at monad resolution, and which mostly comprises records from 2010 onwards as this is when recording at monad level became usual. Records are generally on chalk or the Dungeness shingle, but the odd record deep in the Weald represents plants parasitic on *Calluna vulgaris* (Heather) at Bedgebury pinetum.



***Cuscuta epithymum* Kent records to 2024 mapped at monad level, from BSBI database.**

Cuscuta epithymum is a plant with leaves reduced to minute scales and without visible chlorophyll, consisting of slender thread-like reddish stems which are attached to a host plant, from which nourishment is derived via projecting growths (haustoria). The inflorescence comprises a small dense head of sessile flowers. It has been described as an annual species, but would appear capable of surviving over winter through tubercles attached to the host plant. The ability to over-winter is mentioned by G.E. Smith in his *Catalogue of Rare or Remarkable Phaenogamous Plants collected in South Kent* (1829), although this is in relation to observations at Hastings. Perennation via the tubercles may enable local spread without reliance on seed production.[161]

Whilst it is not always easy to trace which is the host plant amidst a mass of twining stems, the attachment of the haustoria provides evidence. In Kent, the principal hosts are, as mentioned, *Ulex europaeus* and *Teucrium scorodonia*. However, other plants have been recorded as involved. Joyce Pitt (1994)[162] has described its presence on the chalk at Polhill Bank (TQ5060) where in July 1993 Dodder was parasitizing nine different species: *Asperula cynanchica* (Squinancywort), *Centaurea nigra* agg. (Knapweed), *Cirsium acaule* (Dwarf Thistle), *Galium album* (Hedge Bedstraw), *Helianthemum nummularium* (Common Rock-rose), *Hypericum perforatum* (Perforate St John's-wort), *Leontodon hispidus* (Rough Hawkbit), *Lotus corniculatus* (Common Bird's-foot-trefoil) and *Poterium sanguisorba* (Salad Burnet).

In contrast, a visit to a shingle population near the old lighthouse at Dungeness (TR0816) a week later produced record of eight host species, only one of which duplicated the chalk species: primarily *Cytisus scoparius* (Broom), *Silene nutans* (Nottingham Catchfly), *Teucrium scorodonia* (Wood Sage) and *Ulex europaeus* (Gorse), but also *Carduus tenuiflorus* (Slender Thistle), *Centaurium erythraea* (Common Centaury), *Cerastium fontanum* (Common Mouse-ear) and *Lotus corniculatus* (Common Bird's-foot-trefoil). Furthermore, *S. nutans* (79%) and *T. scorodonia* (18%[163]) were also found to be the principal hosts in a comparable shingle habitat at Lydd airport by Fred Rumsey in a 2014 survey which identified 66 locations for Dodder (in TR0620, TR0621, TR0720 and TR0721), including a case where the parasite was damaging its host.

Lydd airport, *Cuscuta epithymum* parasitizing *Silene nutans*. Photo by Fred Rumsey

Kent specimens in **MNE** provide evidence of host plants including species mentioned above, plus *Chenopodium album* (Fat-hen), *Erica cinerea* (Bell Heather), *Medicago sativa* (Lucerne), *Origanum vulgare* (Wild Marjoram), *Pimpinella saxifraga* (Burnet-saxifrage), *Scabiosa columbaria* (Small Scabious), *Solanum nigrum* (Black Nightshade) and even *Euphrasia nemorosa* (Common Eyebright), a case of a hemiparasite itself being parasitised.

In spite of the abundance of historic records for heathlands and commons, recent similar records are largely lacking, presumably because of habitat loss and modification, although a KBRG meeting in 2011 found groups of plants widely scattered over *Calluna vulgaris* heath at Bedgebury.

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[161] Shillito, J.F. (1952). Note on the perennation of Dodders. *Watsonia* **2**: 239-242.

[162] Pitt, J. (1994). Dodder and its hosts in Kent. *Kent Field Club Bulletin* **39**: 41.

[163] For the remaining 3%, it could not be determined which of the two species might be regarded as the principal host.

Cuscuta as a genus is distinctive and the only British native species seen in Kent apart from *C. epithymum* has been, long ago, *C. europaea* (Greater Dodder), a larger and more robust species generally growing on Urtica dioca (Common Nettle) with styles (including stigmas) not projecting beyond the ovary. Alien species have occasionally been encountered, e.g. *C. epilinum* on flax (1860) and *C. campestris* (recorded at three sites in 2017, apparently a contaminant of Niger seed); and it is at least possible that what appeared to be *C. epithymum* growing on *Aster* spp. in a Chipstead allotment in 2013 may have represented *C. campestris* or another alien species introduced through seed contamination.

Cynoglossum officinale L. (Hound's-tongue)

vc 15 and 16

Rarity / scarcity status

Hound's-tongue is fairly widespread in England and Wales, but restricted in Scotland and Ireland. Because of its sharp decline since the 1950s, in part reflecting herbicide spraying and loss of habitat, it is both in England and in Great Britain treated as **Near Threatened**. Whilst the English risk assessment of this species involved a comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 producing a calculated decline of 28% in the likelihood of recording the species, the Kent data since 1971 do not support the contention that this is a species now in decline. In Kent, it is not uncommon and it appears to be increasing. It is a Kent axiophyte, an indicator of good habitat.

Account

The first published Kent record for *Cynoglossum officinale* is in Thomas Johnson's *Iter Plantarum* (1629). Having started from St Paul's Cathedral on the morning of 13 July, Johnson came across "Cynoglossum maius vulgare" after dinner by the main road from Gravesend to Rochester. The next day, he also recorded it in the course of a walk from Stoke to Cliffe, via High Halstow and Cooling, most of his exhausted companions having abandoned him for a lift in a brewer's dray. Hanbury & Marshall (1899) assessed the species as widespread, but especially frequent on the chalk and on sandhills or shingle by the sea. Francis Rose, writing c. 1960, described it as a native of grassland, scrub and bare ground on chalk, generally common but unrecorded in the Dover area; and on ragstone, local; sand dunes, banks and shingle beaches by the sea, locally common; particularly common up to 1954 around rabbit-warrens on the chalk; it appears unpalatable to rabbits.

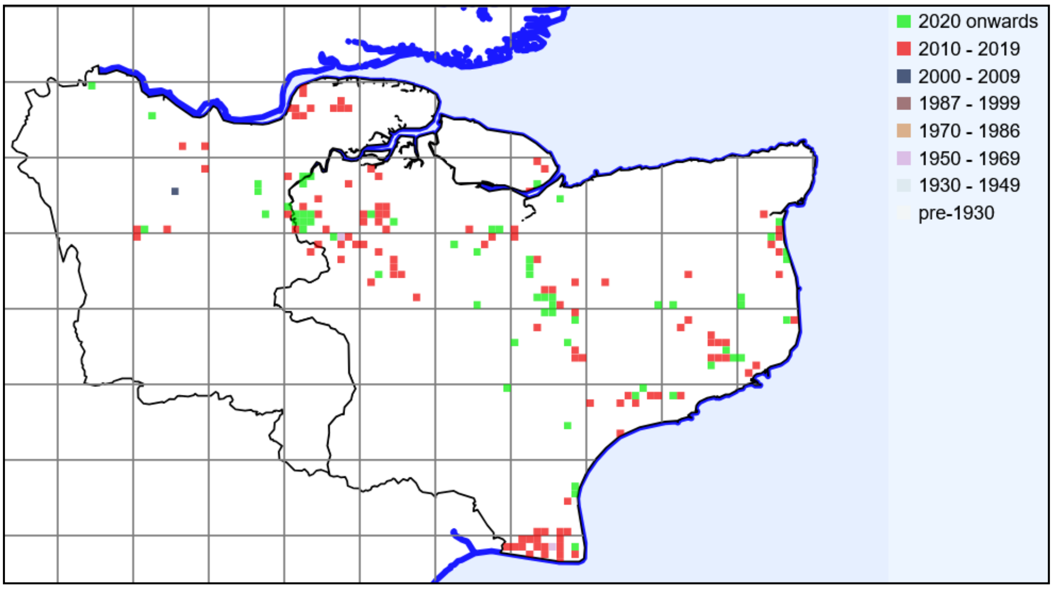
There is some evidence in the *New Atlas of the British and Irish Flora* (2002) of pre-1970 presence in hectads which lack subsequent records. However, no decline since 1970 is shown by Philp (2010), where 59 tetrad records are listed, against 55 in Philp (1982). Both are less than the extent of findings since.

Sandwich. Photo by Lliam Rooney, 24 May 2010

In Kent, the species continues to favour open chalk and coastal areas on sand or gravel. It is a biennial or short-lived perennial of bare or broken areas on dry, well-drained, disturbed ground. On the chalk grassland of the North Downs it can cover entire slopes, but is particularly often found towards the base, where cattle disturbance increases. It is toxic to cattle and horses, due to pyrrolizidine alkeloids, especially in the rosette leaves. The rosettes accordingly have a degree of protection in their first year of growth and can also survive drought, once the taproots are sufficiently established (rooting depth is up to 34cm in the first year), delaying flowering until favourable conditions arise. In many places in Kent, Hound's-tongue is associated with rabbit disturbance, and presumably the rabbits (as well as other grazing animals) provide a vector for spread of the burred seeds (and fertiliser). Otherwise, the seeds are fairly heavy and generally fall within a couple of metres of the parent plant[164].

Phil Green (personal communication) has noted that there is some evidence of spread on the downs above Folkestone so as to appear in new sites near footpaths, as though carried by walkers. Having arrived, the species may then disperse further within its new location through cattle grazing.

Cynoglossum officinale **Kent records to 2024 mapped at monad level, from BSBI database.**



Alkham. Photo by Sue Buckingham, 16 May 2011

Our 2010-24 records, which represent nearly all those mapped above on monad level (as monad recording became standard only in 2010) comprise 176 monads, or 124 tetrads. Comparison of tetrad totals shows an increase of 125% from the 1970s. So either, as seems likely, the species is currently spreading, or recent surveys have been more thorough. It is possible, noting Francis Rose's remarks that Hound's-tongue was particularly common around rabbit-warrens until 1954, that the advent of myxomatosis in Kent in 1953 was not only damaging to the rabbit population, but also affected Hound's-tongue through the decreased availability of bare ground and the diminished opportunity for the seed to spread attached to rabbits. By the 1970s genetic resistance to the disease was detected in wild rabbits and by the 1980s rabbit populations had recovered to 20% of pre-myxomatosis levels[165]. So it may well be that at least some of the increase of Hound's-tongue since the 1970s is associated with the effect of a level of recovery in rabbit populations.

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[164] Ecological data generally are summarised in Upadhyaya, M.K. et al. (1986), The Biology of Canadian Weeds. 87. *Cynoglossum officinale* L. Canadian Journal of Plant Science 68: 763-774. Also: de Jong, T., Klinkhamer, P.G.L. & Boorman, L.A. (1990). Biological Flora of the British Isles *Cynoglossum officinale* L. *Journal of Ecology* **78**: 1123-1144.

[165] Flowerdew, J.R., Trout, R.C. & Ross, J. (1992). Myxomatosis: population dynamics of rabbits (*Oryctolagus cuniculus* Linnaeus, 1758) and ecological effects in the United Kingdom. *Scientific and Technical Review* **11(4)**: 1109-1113.

Cynoglossum officinale is not readily confused with any other British species except for *Cynoglossum germanicum* (Green Hound's-tongue), which is extinct as a native in Kent (although some historic records are in any event doubtful), but is still found in the Trottiscliffe-Ryarsh area as a result of a reintroduction by Francis Rose in 1958. *Cynoglossum germanicum* prefers a more shaded habitat whereas *Cynoglossum officinale* grows in the open; the former also lacks a thickened border to its seeds.

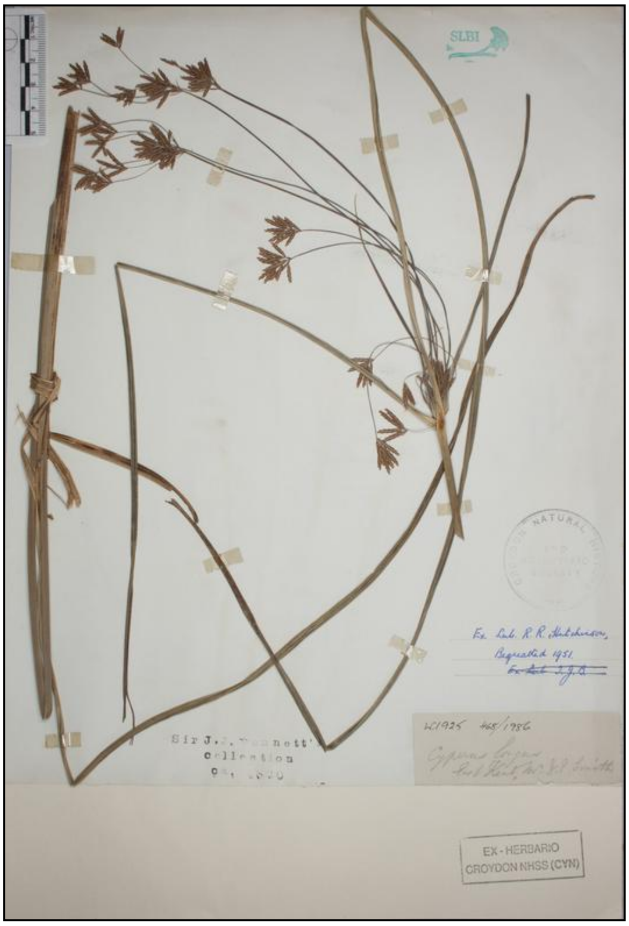
Sandwich.
Photo by Lliam Rooney,
24 May 2010

Cyperus longus L. (Galingale)

vc 15 (vc16 records are taken to be escapes)

Rarity / scarcity status

Galingale is in the British Isles primarily a southern and western plant, but its native distribution is obscured by garden escapes and amenity plantings. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 20% in the likelihood of recording the species. This just reaches the threshold for designation as **Near Threatened**, and so approaches qualification status for a level of risk of extinction in the wild. It is similarly listed for Great Britain as a whole. It is treated as **nationally scarce** and as Plant Atlas 2020 notes its presence in 537 GB hectads in 2000-19, the scarcity status (presence in only 16-100 hectads) arises through categorisation of most records (including Kent's) as introductions. The nearest records credited as 'native' are in Hampshire and West Sussex. In Kent, it is improbable that there is continuity with historic records when the plant may have been native; and if one considers recent records, then it is almost scarce in the county, but it may be considered **rare** if occurrences (i.e. nearly all) which are likely to be escapes or plantings are discounted.

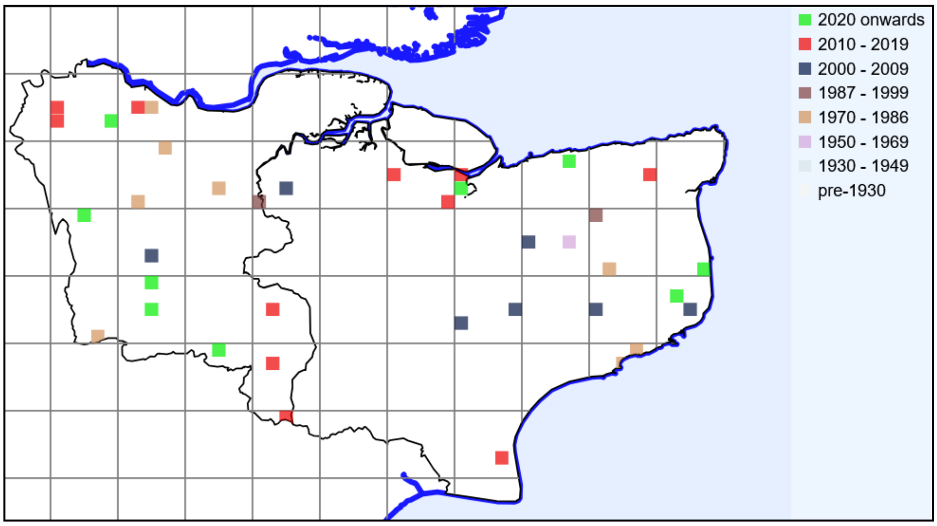

Cyperus longus, East Kent, specimen in **SLBI.**

Account

The first Kent record was given (at length) by G.E. Smith in his *Catalogue of Rare or Remarkable Phaenogamous Plants collected in South Kent* (1829): 'spread over a confined black, boggy tract at Whiting Brooks, above the Warren, near Seabrooke' at the angle of a copse and flourishing beneath the shelter of trees, especially around their trunks. There is an early specimen at **SLBI**, with a label '*Cyperus longus*, East Kent, Mr. G.E. Smith' and it was also collected by others subsequently. Francis Rose in his manuscript *Flora of Kent* (1950s/60s) stated that 'the habitat is unchanged, except that it is overgrown, and a large cyperaceous species, which could be *C. longus*, still exists here, but never produces inflorescences'. The plant was not found upon search in 2017, the area (now Whitenbrook Wood, Hythe) having apparently been affected by golf club works and herbicide as well as *Salix* shading.

Another site where a case could be made for native status is one noted by Francis Rose as having been discovered by Miss B. Nash in 1957; it was extant at least until 1962. The location was described as a roadside bank, by the course of a former stream from chalk springs, near Walmer station, and probably a survival of a very different former habitat here. (From this one may assume that its then current state was much drier than might be expected; but old ordnance survey maps do not indicate a stream by which the location may be identified now.)

Philp (1982) gave ten tetrads across the county (but not the Walmer site) where recorded 1971-80 in marshy places by ponds and ditches 'with a chance that at some of these it has been deliberately introduced'. Philp (2010) gave 11 tetrads for 1990-2005, largely different, and treating the species as introduced: well established plants at the edges of ponds, lakes and streams. Our 2010-24 records amount to 20 tetrads (21 monads). The fact that monad and tetrad totals are almost identical points to a lack of clustering of populations. The historical pattern of records, shown in the accompanying tetrad distribution map emphasises this: the spacing of records is remarkably random. This is a classic indication of an introduced plant.



***Cyperus longus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

While many of our recent records are explicitly noted as presumed planted, it seems safest to assume that all records are likely to be of introductions, unless full consideration of a particular example suggests otherwise. Most records in any event are at roadsides or by rivers or other waterbodies where there is public access or there are amenity plantings which point to the prospect of deliberate introduction. The most persuasively non-introduced recent find was by Steve Coates in July 2023 at Walmer (not the historic site). It shares with the previous presumed native sites an eastern coastal location, which offers potential for transmission from the Continent via birds; both gulls and geese have been observed here. The situation may be analogous to its status given for Belgium by Bellanger (2010)[166]: 'Some populations are found in more or less remote locations and could have been introduced by migrating birds, possibly from nearby, natural populations in neighbouring countries...Two clumps appeared in coastal dunes shortly after removal of the topsoil...It is not impossible that....*Cyperus longus...* emerged from a very old exposed seedbank (and....formerly was a rare native in Belgium, for instance in the Middle Ages)'.

Walmer. Photos by Steve Coates, 22 July 2023

The find was at a brackish pool c.130m north of the enclosed garden and grounds of Walmer Castle, TR 37735 50262. Old aerial photographs and ordnance survey maps do not suggest any incorporation in formal landscape planting and the pool has been present at least as far back as the 1870s. The base of the pool is about 1.5m below ground level, which is below the 5m ordnance survey contour, c.200m from the high water tide mark. *Cyperus longus* dominated the pool, with associated flora including *Eleocharis palustris* (Common Spike-rush), *Carex divisa* (Divided Sedge), *Crassula helmsii* (New Zealand Pigmyweed), *Potentilla anserina* (Silverweed) and a small amount of *Ranunculus baudotii* (Brackish Water-crowfoot). It seems reasonable to assume that the *Cyperus* could be regarded as native here in the sense of having arrived by non-anthropogenic means, with *Crassula helmsii* having also been carried by birds.

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[166] Bellanger, S. (2010). Cyperus longus, in *Manual of the Alien Plants of Belgium*, https://alienplantsbelgium.myspecies.info/content/cyperus-longus

Cyperus longus is a perennial of marshy ground, spreading in patches by means of thick rhizomes. It has been questioned whether it sets ripe fruit in Britain, Syme (1886)[167] having said that he had never seen the mature nut, although having gathered Isle of Wight material as late as the end of September. Gerard, too, remarked on its late development, 'Its period of flowering, the spikes very slowly advancing to perfection, is considerably later than the period [July] stated in the English Flora'. An extended development period is presumably favoured by the warmth and sun exposure of its recognised British native habitats along the south coast, so long as its substrate retains dampness. With a warming climate, its ability to grow (whatever the position as regards reproduction) more effectively has led to it being identified as a potential climate change winner in Britain, with modelled conditions to 2050 showing suitability as far north as southern Scotland.[168]

It is a distinctive plant, and separable from *Cyperus eragrostis* (a garden plant which seeds all too well) by the latter having a more compact inflorescence with greenish- to yellowish-brown spikelets rather than the reddish-brown of *C. longus*.

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[167] Syme, J.T. Boswell, ed., *English Botany; or coloured figures of British Plants*, 3rd edition, (1886) Vol. X. London.

[168] Simpson, D. A., Yesson, C., Culham, A., Couch, C. A. and Muasya, A. M. (2011.) Climate change and Cyperaceae. In: Hodkinson, T., Jones, M., Waldren, S. and Parnell, J. (eds.) *Climate change, ecology and systematics.* Cambridge University Press, pp. 439-456.

Kent Rare Plant Register Species accounts Part D

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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The register formerly included the following species account which may now be found at **Appendix A** of the register, https://bsbi.org/kent

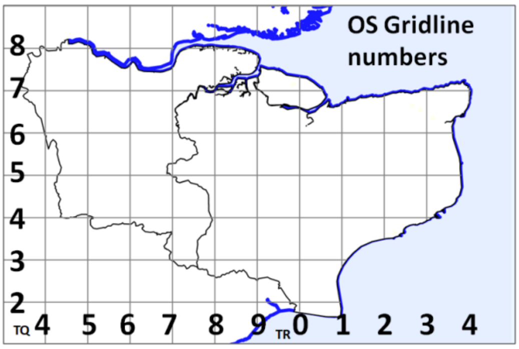
Dipsacus pilosus L. (Small Teasel)

Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at **tetrad** (2 x 2km squares) or **monad** (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AB Alan Blackman
AL Alex Lockton
BBe Ben Benatt
BD Mrs B. Dodds
BH Betsy Hewson
BT Barry Tattersall
BW Brian Woodhams
CB Carloine Bateman
CC Chris Cook
CR Chris Rose
DAN David A. Newman
DCh Danny Chesterman
DJ David Johnson
DM Daphne Mills
DS David Steere
DT Dan Tuson
EH E.M. Hillman
EGP Eric Philp
FR Francis Rose
GK Geoffrey Kitchener
HS Heather Silk
HSt Holly Stanworth
IHB Ilse Hendriks-Bevan
JA Jan Armishaw
JBe Jim Bevan
JBel J. Belsey
JB John Badmin
JM Joumana Mobarak
JP Joyce Pitt
JRP John Palmer
JT John Taplin
JW Jo Weightman
KBRG Kent Botanical Recording Group
KFC Kent Field Club
LH Lorna Holland
LM Lesley Mason
LR Lliam Rooney
ME Michael Easterbrook
MGa Megan Gasson
MK M.E. Kennedy
MR Mike Robinson
NB N.H. Bertrand
PA Pat Acock
PF Peter Forrest
PHe Peter Heathcote
PR Paul Ripley
PS Philip Sansum
PSm Pamela Smith
RC Ray Clarke
RF Rosemary FitzGerald
RMB Rodney Burton
RR Rosemary Roberts
SC Steve Coates
SD'A Stephanie D'Agorne
SH Sam Hartley
SL Stephen Lemon
SB Sue Buckingham
SK Sarah Kitchener
SM Steve McArragher
SW Steve Weeks
PW Philip Wilson
WHG W.H. Griffin

Other abbreviations and references:

BPS = British Pteridological Society
BSBI = Botanical Society of Britain & Ireland
CGE = University of Cambridge Herbarium
Hanbury & Marshall (1899) refers to their *Flora of Kent*
KWT = Kent Wildlife Trust
LNHS = London Natural History Society
MNE = Maidstone Museum Herbarium
Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp

Dactylorhiza incarnata (L.) Soó (Early Marsh-orchid)

vc 15 and 16

Rarity / scarcity status

Dactylorhiza incarnata is fairly widespread in the British Isles, and its subspecies *incarnata* is not regarded as being subject to conservation concerns generally. This is the subspecies which is known in Kent where, however, there are very few colonies, so that its county status has been scarce and now appears **rare**.

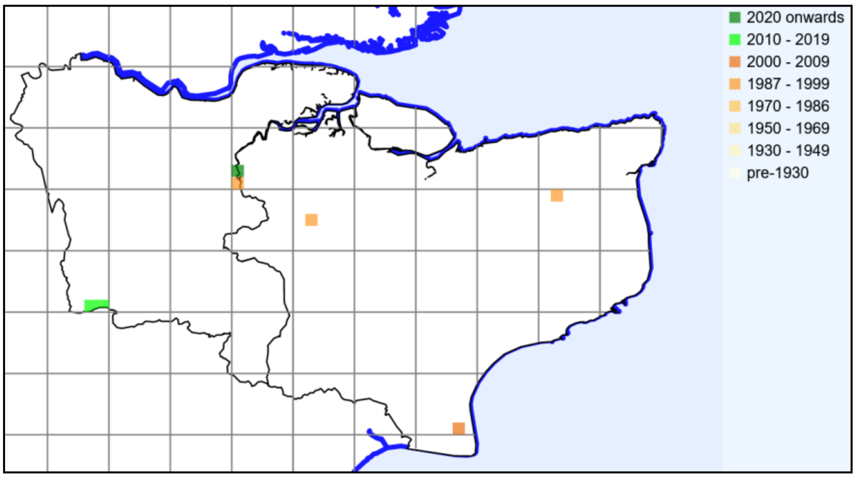
Holborough Marshes. Photo by Greg Hitchcock, 2005

Account

The Early Marsh-orchid has always been scarce in Kent, and was not published for the county until 1869, when J.T. Boswell Syme mentioned in the third edition of *English Botany* that he held a specimen or specimens from Kent, but without giving any more detailed location. There is an earlier sheet of specimens labelled as this species collected by Joseph Woods in 1845 from Maidstone, east of the Medway, held at the South London Botanic Institute. Old records, however, could exist under the name *Orchis latifolia*, which was used to cover both this taxon and *Dactylorhiza praetermissa* (Southern Marsh-orchid).

Hanbury & Marshall (1899) regarded *Dactylorhiza incarnata* as rare in moist meadows, but could only give records for Minster Marshes in Thanet (from John Stuart Mill's herbarium), Lamberhurst and Ham Ponds. The latter location has had a long history of occurrences, the species having been found at Ham Fen by Francis Rose in 1991. He considered it to be a rare and local species of fens and fen-meadows in the county.

In recent times, the most constant records - given in both Philp (1982) and Philp (2010) - have been from the Snodland area, in particular Holborough Marshes KWT reserve. The hybrid between this species and *Dactylorhiza praetermissa* has been recorded (at Snodland by Eric Philp in 1980 at TQ76A, and at Holborough by David Steere from 2016 to 2019 at TQ 706 624). Also, the hybrid with *Dactylorhiza fuchsii* is known from Holborough (seen by Daphne Mills on 27 May 2013 at TQ7062[169]). Setting aside the Snodland/Holborough tetrads of TQ76A & B, three other tetrad records for Early Marsh-orchid were given by Philp (1982), and two different ones by Philp (2010), which suggest that this can also be a plant which comes and goes.



***Dactylorhiza incarnata* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Our 2010-23 records are

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[169] A photograph of this plant was sent to Richard Bateman, who remarked that 'this particular hybrid combination does tend to be especially vigorous and characterised by over-expressed barred leaf markings, and although the flower resembles *fuchsii* more closely than *incarnata*, the wide spur and relatively robust bracts speak of marsh orchid genes'. The possibility of hybridisation having occurred at a damp copse, presumably in the Cranbrook area, was canvassed by A.W. Hudson at *Nature Notes* (1902) **13**: 158, referring to *O. latifolia* (=*D. incarnata*) and *O. maculata* (a name which then covered *D. fuchsii* and *D. maculata*).

limited to three tetrads (from the same number of monads), at Holborough and Cowden.

Holborough Marshes, habitat. Photo by Stephen Lemon, June 2013

Dactylorhiza incarnata requires damp, base-rich ground. The Kent chalk pit locations will obviously have supplied a strongly calcareous substrate; the (former) Shoreham site in the Darent valley will have been influenced by the adjoining North Downs chalk; the old Hollingbourne site was in a wet meadow by a chalk stream; and Holborough Marshes is similarly influenced by the North Downs chalk through which the Medway Gap runs. The base influence, however, is not so obvious at Cowden Meadows, which is regarded as a damp neutral grassland site but, being on Wadhurst Clay Formation, may have some occasional calcareous content.

This Marsh-orchid has distinctively yellow-green, erect leaves, hooded at the tip; the flower lip has sides which are strongly and distinctively turned back. Subspecies *incarnata* usually bears flowers of a delicate flesh-colour, hence the name. All the Kent colonies of which Francis Rose was aware were of the type with flesh-coloured flowers except for the water meadows at Chilham, where it grew in abundance in the 1940s and 1950s, and included some plants with purple flowers.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Cowden Meadows	TQ4741, TQ4841	SSSI	(1) 21 June 2015 (2) 12 June 1982 (3) After 1970, before 1981	(1) SL (2) JP (3) Philp (1982)	(1) (a) Single plant near public footpath, TQ4741. (b) TQ 48058 41465, single plant with pale flowers, broken loop on labellum, on flushed slope. (2) TQ 479 415. (3) Given as TQ44Q. Found in 1970 by RC.
Shoreham	TQ56G		After 1970, before 1981	Philp (1982)	Also recorded by FR in a wet alluvial meadow north of Shoreham in 1954 (appears to be TQ5262). The site was destroyed in the 1970s (RMB, pers. comm.), leaving no suitable habitat in the Darent Valley. There are other historic records in the Darent valley, e.g. as frequent in meadows by the river above Eynsford and Lullingstone (1904, WHG).
Snodland, including Holborough Marshes	TQ76A &B	Holborough Marshes, KWT managed reserve	(1) 16 June 2022 (2) 2 June 2015 (3) 2013. (4) after 1990, before 2006 (5) 23 June 2000 (6) TQ7062, 23 June 1980	(1) AL & BBe (2) SW (3) various (4) Philp (2010) (5)EGP & PHe (6) FR	(1) TQ 707 624. Holborough Marshes. (2) Count of 237 flowering spikes, assumed to be for TQ7062. (3) Known to many botanists at the Holborough Marshes reserve and a count of 302 flowering spikes was made by SW, 13 June 2013. The species is well scattered there - sample locations are TQ 706 623 and TQ 707 624. (4) Recorded as TQ76A. (5) Recorded as TQ76B. (6) Fen meadow north east of Snodland (appears to be Holborough Marshes).
Leeds / Hollingbourne	TQ85H		After 1970, before 1981	Philp (1982)	Wet meadow. Probably TQ 862 535 by chalk stream recorded BD 1961-2 (FR's MS Flora).

Lydd Airport	TR0621		6 and 9 June 2005	JP	
Near Wickhambreaux	TR25J		After 1970, before 1981	Philp (1982)	Marshy area. May be related to a record noted by FR at Preston Marshes.
Plucks Gutter	TR26R		After 1970, before 1981	Philp (1982)	Also recorded here in fen pasture by FR in 1952, present at least to 1962.
Ham Fen	TR3454		24 July 1991	FR	

Dactylorhiza maculata (L.) Soó (Heath spotted-orchid)

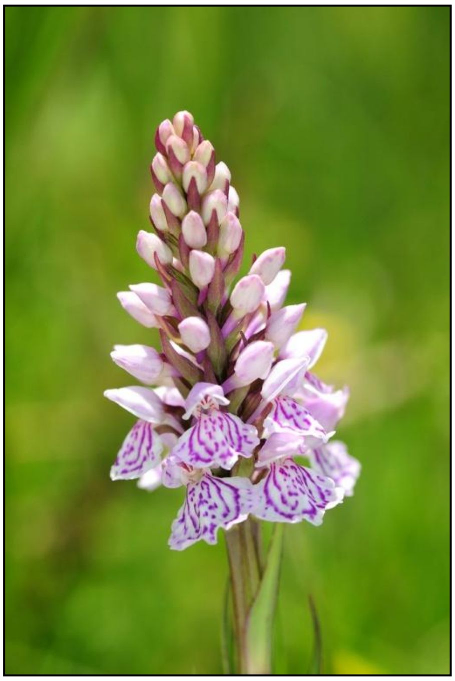
vc 15 and 16

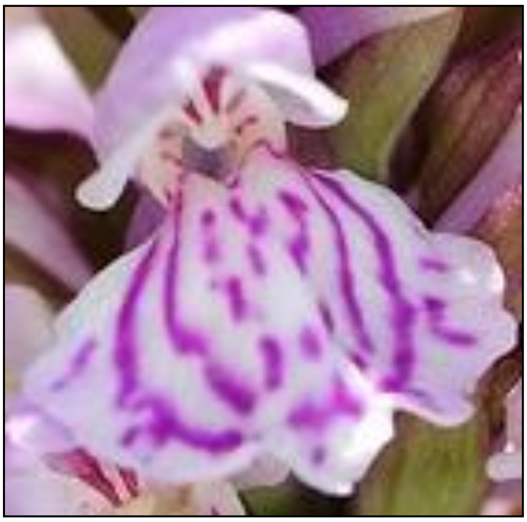
Rarity / scarcity status

The Heath Spotted-orchid is widespread and fairly common in the British Isles, other than in parts of central and east England (excluding East Anglia). Whilst there has been some decline due to loss of lowland heath and bog habitats, its threat status is regarded as of 'Least Concern' both in England and in Great Britain generally. Kent has been affected by such losses, and there are relatively few colonies; it is accordingly ranked as verging on **scarce** in the county. As a Kent axiophyte, it is an indicator of good habitat.

Account

Historic local floras provide little evidence of early occurrences and population trends for this species, for it was long aggregated with the Common Spotted-orchid, *Dactylorhiza fuchsii,* and the name *Orchis maculata* was used to cover them both. For British botanists, the distinction between them was made clear by G.C. Druce in 1915[170]. Druce's clarification was soon followed by *D. maculata* being collected in west Kent, a specimen gathered by Davis from Keston Common in 1917 being held in **MNE**. A typical example of earlier ambiguous nomenclature is G. E. Smith's *Catalogue of rare or remarkable phaenogamous plants, collected in South Kent* (1829). In this he refers to the spotted palmate orchis, *maculata*, as being found "Upon bogs, and high dry situations. Pale and conspicuous, upon Willesboro' Leas". We may surmise that the plants in high dry situations would now be called *Dactylorhiza fuchsii*, but those upon bogs are likely to have been *Dactylorhiza maculata*; and so far as concerns Willesborough, *Dactylorhiza maculata* was still here in 1955, when recorded by Francis Rose.





Hothfield. Photos by Lliam Rooney, 15 June 2010

It disappeared from Keston Bog after 1958 and there is some ostensible evidence of decline in this species in the county: whereas it was recorded in nine tetrads in the 1971-1980 administrative county survey, there were only six such records in the 1991-2005 survey (Philp, 2010). However, records during 2010-22 amount to finds in 11 tetrads (12 monads), many of them being tetrad squares where presence was recorded either in Philp (1982) or Philp (2010), so that there is a fair degree of continuity over the last 45 years. The lower number of records given in Philp (2010) may just be a result of this being a one-person survey; orchid records respond particularly well to crowd-sourced recording, as with our 1971-80 and 2010-24 data. Although recent records are such that the species may only be regarded as marginally scarce in the county, its continued register status is warranted by the scarcity of good quality bog habitat in the county.

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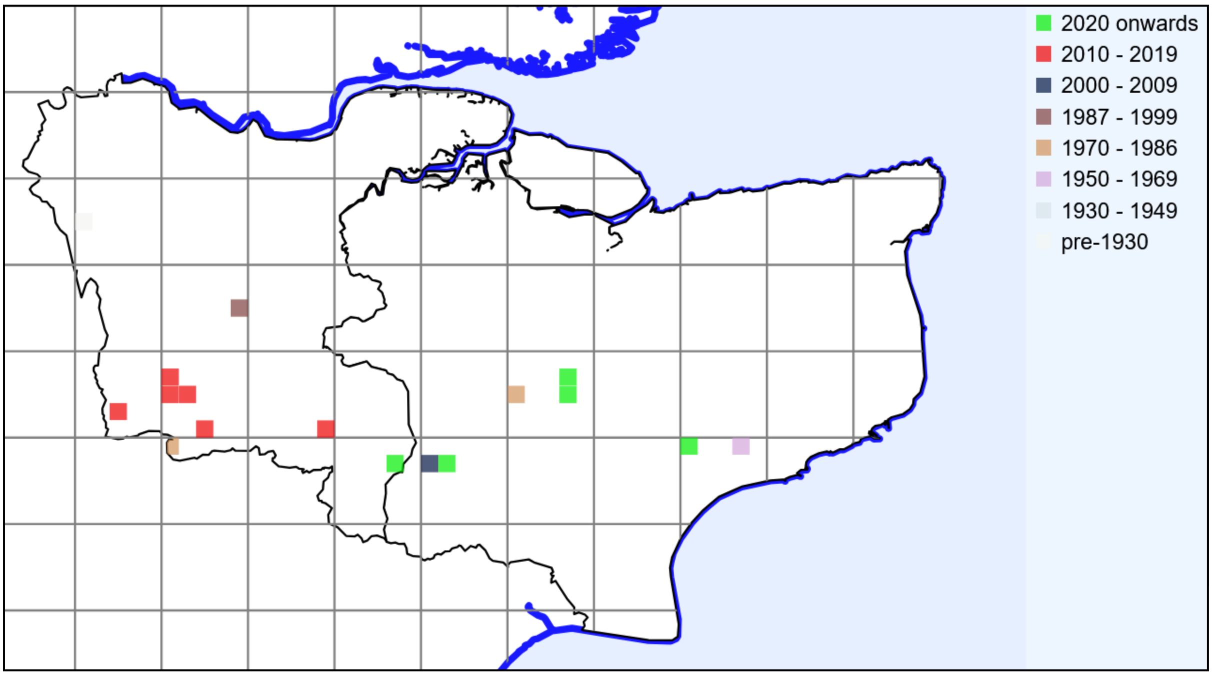
[170] Supplement to Botanical Society Report for 1914, Part II. Orchis maculata and O. fuchsii, *BEC Rep*. (1915) 4: 99-108.

***Dactylorhiza maculata* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Heath-spotted orchid is a plant of wet acid areas, generally overlying sand formations, in the southern half of the county, and has been recorded there in valley bogland, wet meadow, sand pit and (rarely) woodland ride habitats. Within its limited Kent distribution, it can be quite numerous, as at Hothfield. It may be distinguished from the similar Common-spotted Orchid, with which it sometimes grows, by the central lobe of the labellum being half the width of the laterals or more, and much the same length as the laterals or less.

Hemsted Forest, habitat. Photo by Philip Sansum, 19 June 2014.

It is a modest-sized plant, and larger, more robust plants may well be hybrids with *Dactylorhiza fuchsii*. This cross has been recorded at the edge of Bedgebury Forest (TQ73B, EGP, 2002), at Hothfield (JA, 2010) and at Gibbin's Brook (TR1138, KBRG meetings 30 June 2013 and 28 June 2023 – on the latter occasion no pure *D. fuchsii* was seen); but it is an extremely difficult cross to identify, which makes it susceptible to both over- and under-recording. Heath Spotted-orchid has also been found to cross with *Dactylorhiza praetermissa* (Southern Marsh-orchid) at Hothfield (TQ94T, EGP; TQ9645, 29 May 2012, SB confirmed by DJ; TQ967461, 14 June 2017, AB; same, 9 June 2019, SL; TQ 9674 4611, 21 June 2020, AL), Gibbin's Brook (TR13E, EGP; and TR 11609 38703, KBRG meetings 30 June 2013 and 28 June 2023) and Lenham (TQ94E, JP).

Site	Grid reference	Site status	Last record date	Recorder	Comments
South east of Marsh Green	TQ44L	SSSI, KWT reserve	(1) 13 June 2015 (2) After 1990, before 2006	(1) SL (2) EGP (Philp, 2010)	(1) TQ 459 434 / TQ 459 432, over 200 plants flowering with smaller numbers of *Dactylorhiza fuchsii* at Cowden Pound Pastures. (2) Recorded as TQ44L.
Ashurst	TQ53E		After 1970, before 1981	Philp (1982)	
North of Langton Green	TQ5440		18 September 2016	SL	Burnt Wood, ghyll east of Avery's Wood), c. TQ 546 408. Single seeding plant near eastern bank of

					ghyll stream, identified by scattered stomata along upper edge of leaf.
North west of Penshurst	TQ54C		After 1970, before 1981	Philp (1982)	
Polebrook	TQ5047	SSSI	(1) 20 June 2015 (2) 7 July 2013	(1) IHB (2) SL	(1) KFC meeting (2) Two flowering plants at Polebrook Meadows, growing with flowering *D. fuchsii* and seeding *D. praetermissa,* TQ 50554 47837 and TQ 50569 47871. Associates were *Rhinanthus minor, Silaum silaus, Carex pallescens, Carex flacca, Potentilla erecta* and *Centaurea nigra* agg.
Chiddingstone, west of Moorden	TQ5145		(1) 12 June 2016 (2) 16 June 2013	(1) & (2) SL	(1) Moorden Meadow, present in area of open damp grassland at far end of north facing slope down to stream, TQ 51966 45888. Also, flat valley bottom beside public footpath, north side of stream, dominated by *Juncus*, TQ 51964 45916.; Single plant away from main population on flushed north facing slope on south side of stream. (2) Grassy bank fenced off from grazing, c. TQ 519 458, Moorden.
Moorden	TQ54H		(1) 12 June 2016 (2) 21 June 1982 (3) After 1970, before 1981	(1) SL (2) KFC meeting (3) Philp (1982)	(1) Moorden Meadow, flushes on north facing slope down to stream, TQ 520 459 / TQ 521 459. Large number of plants flowering, spread along open bank. (2) Present at Moorden. (4) Recorded as TQ54H. Recorded at Moorden (TQ5245), by FR in 1948, valley bog.
South of Ightham	TQ55X		After 1990, before 2006	Philp (2010)	It was also present in a sand pit south of Ightham in 1950 (FR).
West of Lamberhurst	TQ63M		After 1970, before 1981	Philp (1982)	May be same as boggy field west of Ellis Wood, recorded by FR in 1948, but this area now (2012) appears occupied by a lake.
South east of Brenchley	TQ64V		(1) 13 June 2015 (2) After 1970, before 1981	(1) SL (2) Philp (1982)	(1) TQ 69298 40965, a single flowering plant under dry semi-shaded woodland with *Melampyrum pratense* on southern edge of Furnace Pond.
Bedgebury Forest	TQ7333	CROW access land	2 July 1999	JW & JP	TQ 735 330.
Angley Wood	TQ7636		26 June 2022	SL	Angley Wood, small open fen in valley along western side of Burnt Bank Wood, TQ 760 5371. Possibly a dozen flowers.
East of Sissinghurst	TQ83D		4 July 2001	EGP, BW	
Hemsted Forest	TQ8236	CROW access land	(1) 9 July 2024 (2) 19 June 2014	(1) DAN (2) PS	(1) TQ 82501 36279, Frequent in the area, singles. (2) TQ 8206 3627.
West of Pluckley	TQ94C		After 1970, before 1981	Philp (1982)	
Hothfield	TQ9645	SSSI, KWT managed reserve	(1) 23 June 2022 (2) 13 June 2021 (3) 11 June 2020 (4) 1 July 2019 (5) 14 June 2017 (6)17 July 2016 (7) 2 July 2013 (8) 15 June 2010 (9) 26 June 2008 (10) After 1990, before 2006	(1) AL (2) DS (3) AL & JM (4) AL & JM (5) BT (6) & (7) DS (8) JA (9) DM (10) EGP (Philp, 2010)	(1) TQ 968 456. (2) TQ9645. (3) TQ 9698 4536, typical stand in Bog 1. (4) TQ 9682 4565 by the boardwalk and TQ 9697 4568 at top of Bog 2. (5) 500 plants at TQ 9690 4571. (6) Main bog. (7) TQ 967 455 and scattered elsewhere over reserve. (8) TQ 96951 4570, 150+ plants

					present on bog 2, plus hybrids with *D.fuchsii*. (9) TQ 9686 4572. (10) Given as TQ94S.
Tut Hill/Hothfield	TQ9646	SSSI, KWT managed reserve	(1) 13 June 2021 (2) 2 July 2013 (3) After 1990, before 2006	(1) DS (2) DS (3) EGP (Philp, 2010)	(1) TQ9646. (2) TQ 965 462. (3) Given as TQ94T [so could have related toTQ9745, but less likely].
Hothfield east	TQ9745	SSSI, KWT managed reserve	13 June 2021	DS	TQ9745.
Gibbin's Brook	TR1138	CROW access land, SSSI	(1) 28 June 2023 (2) 30 June 2013 (3) 6 July 2008 (4) After 1990, before 2006	(1) & (2) KBRG meeting (2) JP (3) EGP (Philp, (2010)	(1) southern mire, e.g. at TR 11592 38501. (2) Scattered plants in wet ground of both northern and southern bogs. (3) TR 118 380. (4) Recorded only as TR13E.

Daucus carota L. subsp. *gummifer* (Syme) Hook. f. (Sea Carrot)

vc 15

Rarity / scarcity status

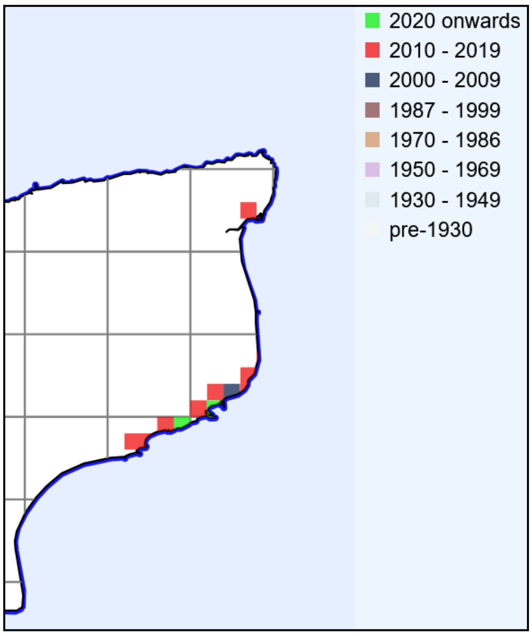
Sea Carrot has a southern and western distribution along British coasts and is also present in southern Ireland. It was formerly treated as nationally scarce, but is no longer so and is not regarded as under any particular threat, and so its conservation status is of 'Least Concern' both in England and in Great Britain as a whole. Its eastern British distribution is extremely local, and it would be treated as rare in Kent if the criterion of three or less tetrad records in Philp (2010) were applied. However, further records have been made, and it would be appropriate to treat this taxon as **scarce** in Kent. It is a Kent axiophyte, indicative of good habitat.

Samphire Hoe. Photo by Sue Buckingham, 16 August 2011

Account

The first Kent record of this subspecies was published in 1724, in the third edition of John Ray's *Synopsis Methodica Stirpium Britannicarum*, revised by Dillenius. This refers to *Daucus maritimus lucidus* as having being 'Found near *Dover* by *Mr. J. Sherard* and *Mr. Rand*'. There is a long history of continuity at this location, the plant having been collected by Charles Babington in 1844 (CGE) and still present at Dover Western Heights in 2010. Hanbury & Marshall (1899) refer to the Sea Carrot as present between Ramsgate and Margate, as well as citing Dover / Folkestone records. However, it now appears to have long gone from Thanet.

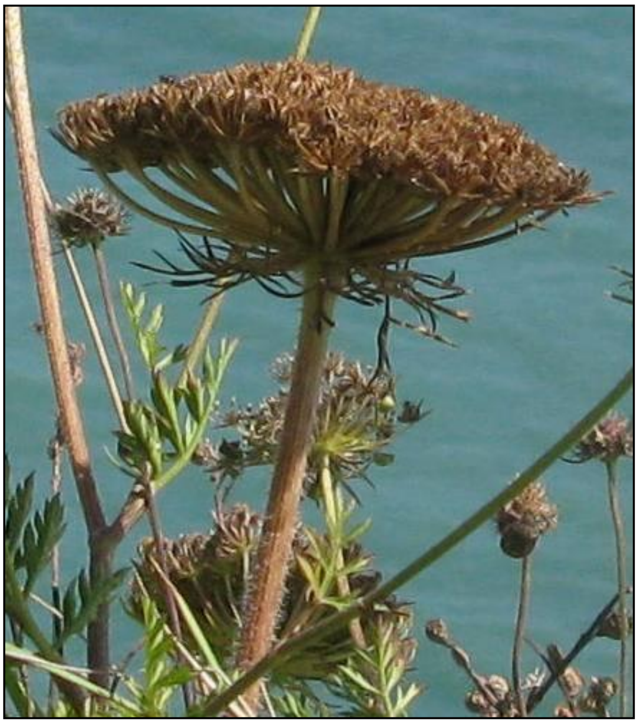
This left, at least in the 1950s and 1960s, colonies along the coast from Folkestone to Kingsdown, Francis Rose having recorded it at Folkestone Warren (1960), East Wear Bay cliffs (1947), Abbot's Cliff (1956), Lydden Spout (1955), St Margaret's Bay (1957) and Hope Point, Kingsdown (1956). From this stretch of coast, Philp (2010) gave records only at Abbot's Cliff, Dover and Langdon Bay (three tetrads). However, this does not represent a contraction, as Sea Carrot has since been found still present from Folkestone to Kingsdown (11 tetrads or 13 monads for 2010-24), although not all localities in between have been surveyed (it has not been found at Langdon Bay, TR34L, since 2000).



***Daucus carota* subsp. *gummifer* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The Sea Carrot in the British Isles is a plant of cliff grassland and stable sand dunes. In Kent, it is not found on dunes. It is present on cliff slopes, in *Brachypodium pinnatum* agg. (Tor-grass) back from the top of cliffs (where the up-draught may have deposited seeds) and at the base as well, and is one of the most constant species in the plant community MC4 (*Brassica oleracea* maritime cliff-edge community). Other constant species are *Brassica oleracea* (Wild Cabbage), *Dactylis glomerata* (Cock's Foot) and *Festuca rubra* (Red Fescue). It is a host plant for *Orobanche minor* subsp. *maritima*.

Hanbury & Marshall (1899) were of the view that the plant is sufficiently distinct that it should rank as a separate species. It is currently treated as a subspecies of *Daucus carota*, being distinguished through being relatively short with the umbels being more or less flat-topped in fruit, i.e. somewhat convex to slightly concave (as distinct from very contracted and concave, like a bird's nest, with subsp. *carota*). Perring & Sell (1968)[171], however, considered that a complete range of intermediates exists between subspp. *gummifer* and *carota*, with the most extreme form of *gummifer* being restricted to Devon and Cornwall (although they apparently did not review Kentish material).



Dover. Photo by Sue Buckingham, 13 August 2011

Site	Grid reference	Site status	Last record date	Recorder	Comments
Folkestone	TR2336		8 October 2011	SB	Base of low cliffs, several plants at TR 23742 36315.
Copt Point	TR2436	SSSI	8 October 2011	SB	Several plants on low cliffs at TR 24036 36471.
Abbot's Cliff	TR23U, includes TR2638, TR2738	SSSI	(1) 15 July 2018 (2) 9 June 2018 (3) 27 October 2014 (4) 22 July 2012 (5) After 1990, before 2006	(1) SB (2) KBRG meeting (3) GK & SK (4) SB (5) EGP (Philp, 2010)	(1) A single plant by public footpath TR 266 386 with strongly convex fruiting head. (2) On the slopes of the undercliff at TR 2627 3839. Many flowering plants looked likely to be this species but one at TR 2627 3839 still had the dry remains of last year's fruiting umbel which was very clearly convex in outline and not at all contracted. (3) TR 277 387, a thin scatter in grassland just inland of cliff-tops, *D. carota* subsp. *carota* also present. (4) Cliff-top grassland at TR 27050 38622. (5) Recorded as TR23U.
Samphire Hoe	TR2838	SSSI	(1) 29 May 2024 (2) 27 October 2014 (2) 16 August 2011	(1) DS (2) GK & SK (2) SB	(1) TR 2827 3873, east of Lydden Spout Beach. (2) One plant in Tor-grass, 15m inland of the cliff-top edge (2) Four plants at base of cliffs, TR 28346 38753.
Samphire Hoe	TR2939	SSSI	1 June 2018	SB	Good example with convex fruiting head observed beside Saxon Shore Way at TR 2896 3918.
Dover Western Heights	TR3140		2 March 2010	GK	Roadside below cliffs. Philp (2010) also gives a more

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[171] Perring, F.H. & Sell, P.D. (1968). *Critical Supplement to the Atlas of the British Flora*, Thomas Nelson and Sons Ltd., London and Edinburgh.

					general reference of TR34A.
Dover castle	TR3241		27 May 2024	DS	TR 3271 4163 Stunted, but flowering plant, parasitised by *Orobanche minor* subsp *maritima* on wall of castle perimeter.
Dover - Langdon	TR3342	SSSI	13 August 2011	SB	2 plants alongside chalk cliff path.
Langdon Bay	TR34L	SSSI	17 June 2000	JBe & EGP	
South Foreland	TR3643	SSSI	21 September 2014	GK	One plant in chalk grassland near cliff edge.
St Margaret’s at Cliffe - Bockhill	TR3745	SSSI	21 September 2014	GK	One plant in chalk grassland close to cliff edge.
Walmer & Kingsdown Golf Course	TR3747		29 June 2006	JP	TR 368 470.
Ramsgate West Cliff	TQ3764		17 July 2018	SB	A single plant with distinctly convex fruiting head at base of cliffs TR 3733 6414
Kingsdown – Oldstairs Bay	TR3847	SSSI	31 August 2011	SB	Four plants in rifle range at TR 38079 47197; 12 plants at base of chalk cliffs at TR 38103 47154; about 20 plants in rifle range TR 38073 47233.

Descurainia sophia (L.) Webb ex Prantl (Flixweed)

vc 15 and 16

Rarity / scarcity status

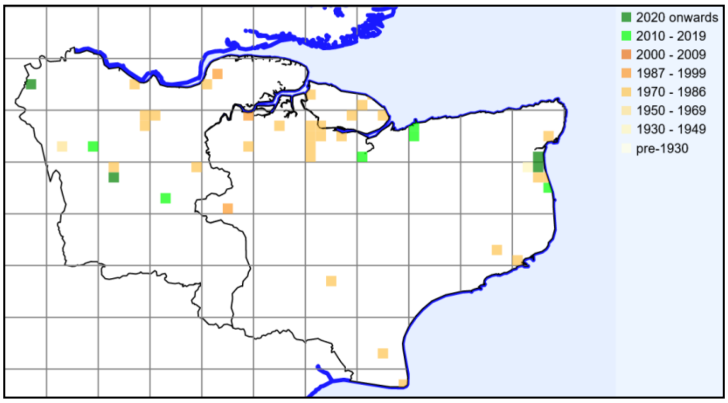
Descurainia sophia is an archaeophyte, or ancient introduction, which is widespread as an arable weed, especially in East Anglia. There was a national decline before 1930, but its distribution is regarded as having stabilised and so its conservation status is considered to be of 'Least Concern' for England and Great Britain. However, there is evidence of a major decline in Kent since the 1970s, such that it is now **scarce** in the county.

Sandwich. Photo by Lliam Rooney, 8 June 2011

Account

The first published record for Flixweed was by Thomas Johnson in the account of his first botanical Kent journey with apothecary colleagues, *Iter Plantarum* (1629)[172]. He mentions having collected *Sophia Chirurgorum* en route from Stoke to Cliffe. The contemporary name meant 'the wisdom of surgeons', and so the plant was an appropriate discovery for a group of apothecaries. Francis Rose commented in the 1972 edition of *Iter Plantarum* that the species was still at Cliffe.

Hanbury & Marshall (1899) regarded it as a plant of fields, roadsides and waste ground, not common, and confined to the north of the county, especially near the sea. This basic distribution pattern was still evident from the 32 tetrad records in Philp (1982) for the period 1970-1981, although there were a few inland records and occurrences as far south as Dungeness. In the course of the 1991-2005 survey published as Philp (2010), however, it could only be traced in arable fields or disturbed road verges in five tetrads. It is not clear what may lie behind this marked decline. It is unlikely to be herbicides, since this species has shown resistance to a range of them. Our 2010-24 records amount to ten tetrads (11 monads), although only one of these is the same as a Philp (2010) site.



***Descurainia sophia* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The historic distribution shown here with the BSBI database tetrad records offers little by way of clues to the reason for losses, although their extent is widespread.

Descurainia sophia is an annual which may over-winter as young rosettes. Swedish studies indicate that only a few seeds will germinate in the autumn of the year of dispersal, but germination generally takes place in the following spring or autumn, or a subsequent one. A seed-bank is likely to exist since nearly 100% seed viability followed burial for 30.5 months[173].

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[172] This is wrongly attributed by Hanbury & Marshall (1899) to the second journey, undertaken in 1632.

[173] Baskin, C.C., Milberg, P., Andersson, L. & Baskin, J.M. (2004 Germination ecology of seeds of the annual weeds *Capsella bursa-pastoris* and *Descurainia sophia* originating from high northern latitudes. *Weed Research* **44**: 60-68.

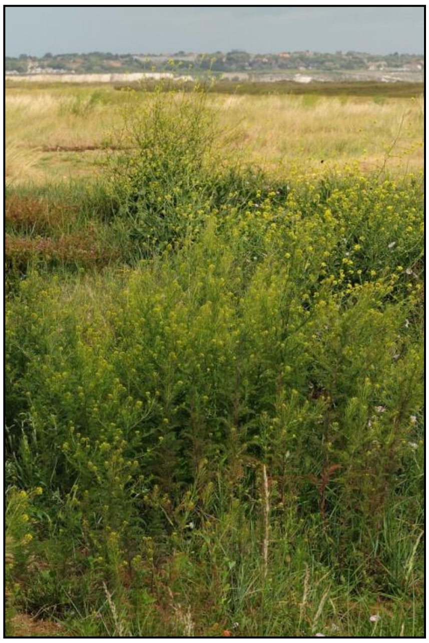
It favours light or sandy soils of arable or otherwise open disturbed ground. It is long-persistent in some localities. As well as at Cliffe, mentioned above, populations at Sandwich have been of long standing, its presence having been mentioned by the author of *Notes and Observations made during a Week's Botanizing in South Kent* in the *Phytologist* of June 1861. At Sandwich, it has been particularly associated with sand at Prince's Golf Course; either imported sand or itinerant golfers have also been a source of records at a former golf course at Halstead.

Urban habitat, Brockley. Photo by Caroline Bateman, 14 July 2023

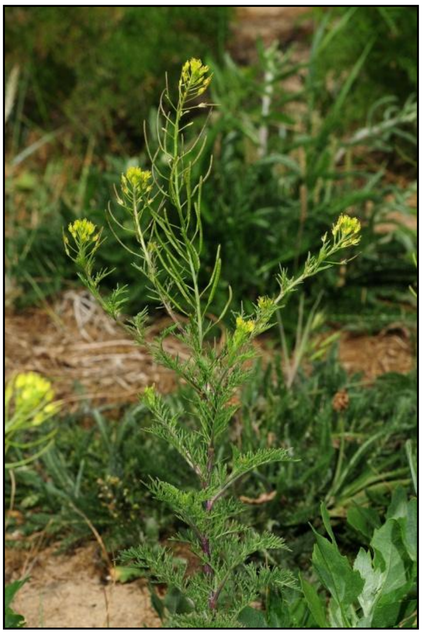
The seeds may spread through wind dispersal, birds and agricultural activities. The species is distinct from other yellow crucifers by virtue of its finely divided leaves.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Brockley (metropolitan vc16)	TQ3675		14 July 2023	CB	Pavement and gutter weed in Foxberry Rd.
Deptford (metropolitan vc16)	TQ3777	Nature park	1992	NB	Casual at (inferred) TQ 374 774.
Downe (metropolitan vc16)	(Probably) TQ4262		1971	EH & MK	On small earth tip north of Downe.
Halstead	TQ4862		27 June 2018	GK	Former golf course. Two large plants on disturbed ground, TQ 48524 62670. Another three in sand bunker, TQ 4851 6256. One more in sand bunker near car park, TQ 4867 6255.
Otford	TQ5357		(1) 25 May2021 (2) 10 July 1971	(1) GK (2) RMB	(1) TQ 5356 5718, one large plant, 1m high, in ruderal vegetation on sand by footpath through working sand quarry. (2) One plant on Vestry Road estate, a remnant of a larger population found by BH in 1967 or 1968.
Dartford Heath	TQ57B		3 May 1984	JRP	60 plants where some disturbance had occurred.
Dartford	TQ5474		13 July 1988	JRP	By Orchard Theatre.
Stone Marshes	TQ57S		5 September 1984	JRP	Half a dozen plants; also seen in large quantity by same recorder at a dump, 7 October 1979.
Fawkham	TQ5967		27 October 1985	RMB	A good colony round a heap of old horse manure in a field near Fawkham Church. Found by JRP and shown on LNHS meeting, 27 June 1981.
Mereworth Woods	TQ6253		15 July 2017	JP	With other weedy species, at entrance to woodland rides near stacking areas for timber.
Teston	TQ75B		After 1990, before 2006	Philp (2010)	
Linton	TQ75K		After 1990, before 2006	Philp (2010)	
Frindsbury	TQ76P		7 June 1987	GK	Abundant on bank of tipped soil at industrial estate.
Gillingham	TQ76Z		After 1990, before 2006	Philp (2010)	
Cliffe	TQ77I		After 1990, before 2006	Philp (2010)	
Faversham	TR06A		(1) 16 June 2017	(1) LR	(1) TR 01661 61819. One plant in

			(2) After 1990, before 2006	(2) Philp (2010)	flower and another not, by a fence at the start of a path at the extreme end of the Front Brents by number 48.
Whitstable	TR1065		30 May 2018	AL	TR 1026 6586, on the edge of the golf course, by the causeway.
Whitstable	TR1066		15 May 2011	JB	TR 108 668, one plant, backstreet weed.
Sandwich Bay	TR3459		30 June 1984	RMB	Sandwich Bay beyond Downs Farm.
Sandwich Bay	TR3461		15 May 2020	SB	One plant on coast footpath.
Sandwich Bay	TR3557	SSSI	23 July 2018	SB	With *Dactylorhiza praetermissa* and *Triglochin palustris* at TR 3579 5750.
Sandwich Bay	TR3559	SSSI	(1) 1 July 2021 (2) 6 July 2019 (3) 26 May 2017 (4) 23 May 2011 (5) 7 August 1986	(1) (2), (3) & (4) SB (5) RF, FR	(1) Many plants colonising a new excavation on Princes golf course at TR 35469 59221. (2) Masses of plants on great piles of sand on Prince's practice range. TR 349 593. (3) About 100 plants flowering on disturbed sandy land alongside the 'new' Princes golf course lodge at TR 3560 5936. (4) 300 to 400 plants in 10 square metres of bare sand on golf course, TR 35269 60161. (5) TQ 356 593
Sandwich	TR3560	SSSI	(1) 16 June 2020 (2) 11 June 2018 (3) 26 May 2017 (4) 23 May 2011 (5) 13 August 1986	(1) SB (2) DCh (3) & (4) SB (5) RF	(1) In a hollow on Princes golf course S (2) 6 plants at edge of track on dunes north of clubhouse. (3) Two flowering plants alongside track to Princes golf club house at TR 3526 6059. (4) Seven plants on bare sand beside track. (5) TQ 354 600.
Sandwich	TQ3655		30 June 2019	SB	A single plant flowering on disturbed sand by a golf course pool TR 3678 5583.



Sandwich. Photos by Lliam Rooney, 8 June 2011



Dianthus armeria L. (Deptford Pink)

vc 15 and 16

Rarity / scarcity status

Dianthus armeria is a plant of southern England which has been in decline since before 1930 so as to become nationally **scarce**, and whose status is now **Endangered** both in England and in Great Britain as a whole. In the 1980s it was reduced nationally to 19 sites, and in the 1980s, 13-16 sites[174]. Plantlife (2007)[175] assessed that, in terms of its distribution in 10km squares across Britain, the species in 2003 could only be found in 7% of its historic area. Few British sites have substantial numbers of plants, and Kent's population at Farningham Wood has been ranked by Plantlife as the largest in Britain. Deptford Pink is included as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006 and it is also protected from picking bySchedule 8 of the Wildlife and Countryside Act 1981. In Kent, the species is **rare** as well as the county containing a population of national significance.

Sandwich. Photo by Liam Rooney, 15 June 2011.

Account

The name of Deptford Pink suggests that this is a plant whose origins lie in West Kent. Gerard gave this name in his *Herball* (1597) to "a Wilde creeping Pinke, which growth in our pastures neere about London, and other places, but especially in the great field next to Detford, by the pathside as you go from Redriffe to Greenewich". This is clearly a description of *Dianthus deltoides* (Maiden Pink), which has a creeping habit; *Dianthus armeria* does not. However, in the 1633 edition, Thomas Johnson added an illustration of *Dianthus armeria,* calling this the "Deptford Pinke". This is puzzling, as there is no doubt that Johnson knew what *Dianthus armeria* was (the evidence for this set out in a paper in *Journal of Botany* (1892) 30: 177-178). For ever after, Deptford Pink has been the name of the plant which Gerard did not describe as from Deptford. In a bid to give some colour to a Kent origin, Hanbury & Marshall (1899) suggest that most probably both species grew at Deptford in Gerard's day, but there is no evidence of this.

Ironically, the first publication of a Kent record for *Dianthus armeria* is also by Thomas Johnson, noted in his *Iter Plantarum* (1629) as encountered on 14 July 1629 in travelling from Gillingham to the Sheppey crossing. He also recorded it in his subsequent journey, published as *Descriptio Itineris Plantarum* (1632), as present en route between Sandwich and Canterbury.

Sandwich. Photo by Liam Rooney, 15 June 2011

In some parts of the county, it was clearly not uncommon in the 19th century. The Revd. Edward Edwards remarked in *The Phytologist* (1844, **1**:1080) that he had noticed it, as a plant of chalky and gravelly wastes and banks, "in abundance this season at Crocking-hill, between St. Mary Cray and Farningham; at Stone, beyond Dartford; and in numberless other localities in the cross-country lanes between Farningham and Gravesend". This abundance is now reduced to the Farningham Wood location. The reference to lanes reflects the unsurfaced nature of highways at the time, providing poached, disturbed ground which would favour *Dianthus armeria* as a short-lived opportunist species.

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[174] [174] Wiggingon, M.J. and Pearman,D.A., *Dianthus armeria* L. (Caryophyllaceae) in (ed. M.J. Wiggington, 1999) *British Red Data Books 1 Vascular Plants*, JNCC.

[175] Plantlife *Dianthus armeria* L. dossier (2007), accessed at http://www.plantlife.org.uk/uploads/documents/Dianthus_armeria_dossier.pdf

Hanbury & Marshall (1899) regarded it as a plant of dry banks, widespread in the county, although local and even then, apparently decreasing. A cluster of records was also given by Hanbury and Marshall east and west of Canterbury, including Thomas Johnson's 1632 find, and these appear since to have diminished to Fishpool Hill Wood, where Francis Rose found it in 1954 on a gravelly bank by a track, and in 1960-63 by the main road (A257), presumably the same road along which Johnson had passed. However, according to Philp (2010), the plant could no longer be traced there, perhaps due to the effect of herbicide sprays, although it might still be present. Subsequent search has also been unsuccessful.

Indeed, the only Kent presence of this species noted in the 1991-2005 survey of Philp (2010) was at Farningham Wood (although a Sandwich site then searched without success has since produced this plant, so that the historic decline of this species amounts to 97% of all recorded Kent sites[176]). The recent history of Deptford Pink at Farningham has been written up by Joyce Pitt, and the following account is substantially based on her account, *Dianthus armeria* at Farningham Wood (*The Newsletter of the Kent Field Club*, May 2012, **75**:18-19).

Farningham wood-bank habitat. Photo by Geoffrey Kitchener, 30 September 2012.

The plant grows along the wood's south-facing boundary on dry, free-draining soils derived from the Thanet Sands, and the warmth and light exposure appear likely to be beneficial to the plant's germination and growth (although a more recently established small colony on the north-facing side of the wood may be an exception to this). It is primarily a self-pollinating biennial, with germination mainly from the end of March, but also continuing in summer and early autumn. It overwinters as a rosette, flowering from late June through to autumn; but may rarely be an annual or short-lived perennial. It is likely that the seeds require light and soil disturbance for germination. At Farningham, open disturbed areas on the wood-bank or the gap between the bank and arable crop offer germination opportunities, particularly where rabbits have scuffed the ground, or a tractor has kicked into the bank. The very light sandy soil also erodes to a degree. The most constant associates are *Agrostis capillaris* (Common Bent) and *Teucrium scorodonia* (Wood Sage).

Deptford Pink was almost eliminated from this location by heavy application of herbicides in the late 1970s. Only one plant was observed by Joyce Pitt in 1981. However, when the farmer was told about the plant and its rarity, this practice ceased, and the plant began to thrive again. In 1983, 250 plants were recorded, and during the 1990s the plants were counted and mapped by an assistant warden of the woodland KWT reserve (e.g. 1166 in 1002; 823 in 1993). By 1999, numbers had risen to c.2000, with up to four times as many seedlings. More recently, Plantlife has adopted a counting role, reflecting the national significance of the colony. Counts have amounted to 1720 plants (2005), 2969 plants (2006), 1682 plants (2007); and In 2010, 1555 plants were recorded, when they were to be found along the wood-bank (including where recently disturbed by rabbits), in the open, bare track at the edge of the field disturbed by farm vehicles, and on a heap of upturned soil at the field margin. In occasional years, a few plants can be seen on the bank at the far eastern end on the field where generally hedgerow species are more dominant. One or two plants usually appear just inside the wood, where there is bare ground near a bench, disturbed by the passage of feet. Only rarely do plants appear within the wood itself, adjacent to the boundary wood-bank; and this again appears to reflect the need for light and disturbance. The population fluctuations may well reflect the incidence of disturbance.

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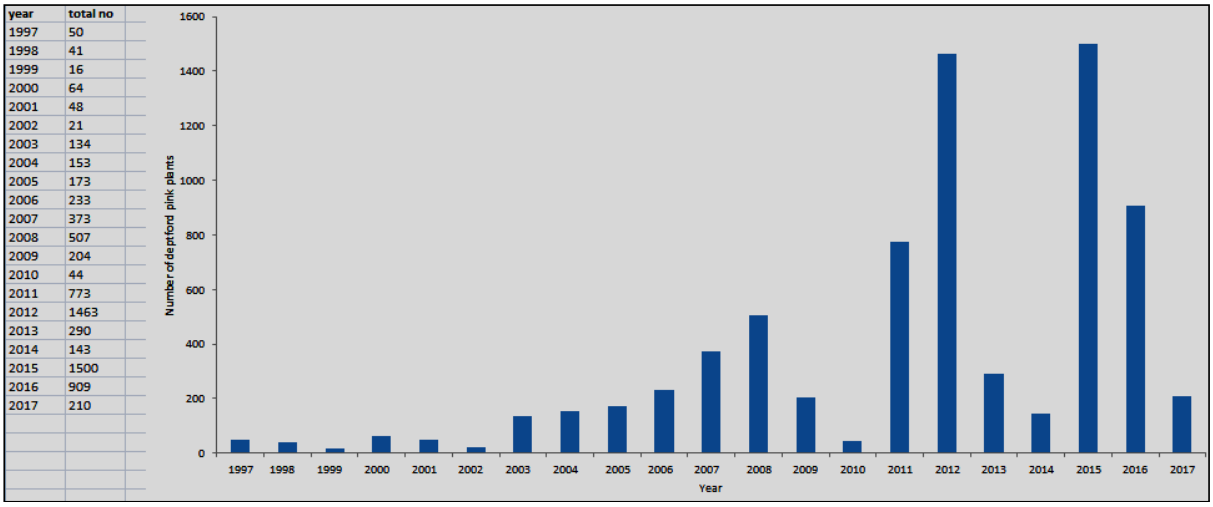
[176] Plantlife (2007), as above.

Farningham. Photo by David Steere, 27 October 2017. This illustrates the long flowering (and hence also seed ripening and dispersal) period.

The Sandwich Bay site has also been written up, by Peter Atherall, in his article, A record year for a Kent rarity (*Wild Kent*, Winter 2011/12, p.8). His monitoring is also reported in KWT's *Ecology and Evidence Newsletter*, Winter 2017-18. He draws attention to the dynamic sand dune system, coupled with rabbit grazing and disturbance, creating open ground for seedling establishment. The population apparently consisted of about 100 plants in 1987, when it was first discovered, by John Taplin, and reached about 200 plants in the period to 1997. KWT monitoring has resulted in counts with a minimum of 16 plants in 1999 and a maximum of 1500 in 2015, without any detectable pattern in the variation from 1997 to 2002 (although year-to-year changes in disturbance are likely to be relevant), but a trend of increase from 2003 with occasional (2010, 2014, 2017) crashes (see chart). The habitat is described (by P.J. Wilson in *Plantlife Report* no. 117, The status and distribution of *Dianthus armeria L.* in Britain, 1999) as falling into two distinct vegetation communities. The first community was just below a dune crest, topped by *Ammophila arenaria* (Marram), with the Deptford Pink scattered in the sparsely vegetated ground below, amongst *Festuca arenaria* (Rush-leaved Fescue) and occasional *Eryngium maritimum* (Sea-holly). The other community was on lower, less bare ground with a slightly less diverse flora, *Elytrigia atherica* (now *Elymus athericus*, Sea Couch) forming a dense sward with Deptford Pink scattered in gaps. Management (2017) involves a winter cut to reduce the density and shading effect of the grass sward, and maintain areas of bare ground essential to seedling recruitment.

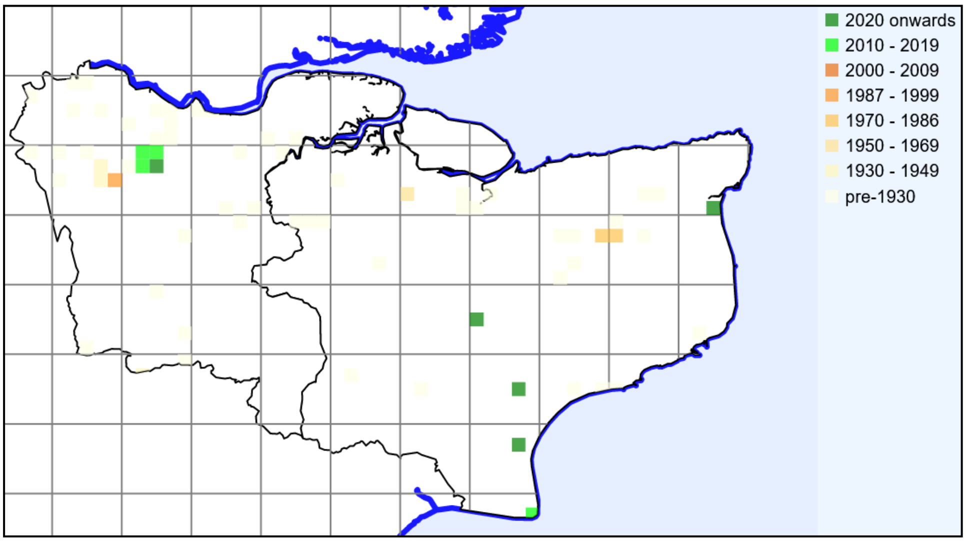
Annual total counts of Deptford pink plants at Sandwich Bay, reproduced with permission of Kent Wildlife Trust



year	total no
1997	50
1998	41
1999	16
2000	64
2001	48
2002	21
2003	134
2004	153
2005	173
2006	233
2007	373
2008	507
2009	204
2010	44
2011	773
2012	1463
2013	290
2014	143
2015	1500
2016	909
2017	210

There are other recent Kent sites, but tending to have obviously introduced origins. Dungeness and Romney Warren are apparently of this nature; a colony at Gigger's Green road-bridge is likely to be so; and a roadside population at Ashford may also be, but is associated with a site that has records of other good quality species which are not suspected of being introduced.

Dianthus armeria **Kent records to 2024 mapped at tetrad level, from BSBI database.**



Deptford Pink is distinguished from other British pinks by its somewhat tall and leggy habit, the flowers being held in clusters, and by the bracts and epicalyx being hairy.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Skeet Hill	TQ4965		20 September 1987	RMB	TQ 495 652, 6 plants on cindery bank of tip, since covered with brambles. Discovered by Mr Vink and seen by RMB at intervals, 1964-87.
Farningham Wood	TQ5368, TQ5367 and TQ5467	Local Wildlife Site SE60	(1) 19 July2021 (2) 2 July 2021 (3) 26 August 2020 (4) 6 June 2015 (5) 7 July 2014 (6) 23 June 2012 (74) 9 July 2010	(1) JP (2) GK (3) DS (4) KBRG meeting (5) JP (6) SL (7) SB and others	(1) Over 250 flowering plants on the usual bank, TQ5467, some were on the bare edge to the field. Distribution may have expanded to the west, but eastern end of bank has become rather rank and was less good. Coppicing of large trees in the wood may have let in much light. (2) TQ 5440 6763, some 15-20m inside wood, on sandy bank exposed by forestry works, five flowering, ten rosettes. (3) Only a few with flowers, the rest in seed, thus impossible to count. Habitat degrading rapidly with encroaching scrub and saplings of *Castanea sativa* and *Quercus robur* taking over the bank they grow on. Found in usual places from TQ 5437 6761 to TQ 5406 6776. (4) From the western boundary of the monad to TQ 544 675, c.1400 plants. Also, a few plants in coppiced sweet chestnut at TQ 5428 6776, plus 88 plants counted from TQ 5398 6780 to eastern boundary of monad (5) c.500 plants counted, none on the eastern bank; one or two on bare soil of tracks. (6) 490 plants on southern facing sloping boundary bank of the wood opposite arable field, between TQ 53975 67817 and TQ 54446 67629, mostly just coming into flower;

					somewhat early for a full count. (7) 1555 plants counted for Plantlife between TQ 53973 67818 and TQ 54419 67628 on sandy bank at woodland edge adjacent to arable field. For earlier records, see text of account above.
Ashford	TR0044		(1) 28 June 2021 (2) 21 June 2021 (3) 21 June 2020 (4) 20 August 2015	(1) HSt (2) GK (3) SC (4) HS	(1) TR 007 449, c.400 plants present in usual place. (2) TR 00726 44936, plants well spread along c.9m of semi-open sandy bank north east of A251 roundabout, shaded to rear. (2) Estimated 150 plants, increasing along sandy verge. (2) TR 007 449, nine plants on a sandy sloping bank by the road at the edge of Eureka Park. The bank had been disturbed, by rabbits presumably.
Aldington south	TR0734		3 July 2023	SB	26 plants scattered on the roadside at Giggers Green bridge and directly at the foot of the bridge wall, of which 17 were on the west side between TR 07051 34208 and TR 07049 34213. and the remaining nine were on the east side of the road. The previous year's old dry stems remained. Substrate was dry and gritty. Associates: *Cerastium glomeratum, Plantago lanceolata, Trifolium dubium, Erigeron karvinskyanus, Helminthotheca echioides, Torilis nodosa* and a single plant of what seemed to be *Scabiosa columbaria*.
Romney Warren	TR0726	Local nature reserve	(1) 1 July 2021 (2) 4 August 2020 (3) 5 July 2019	(1) HSt (2) & (3) SD’A	(1) TR 07702 26126, counted 27 flowering plants and rosettes in neutral meadow. Visitor Centre manager advised this was a polytunnel area before its current state (which has implications for the origin of the species here). (2) TR 077 261, 20 plants, viz. one less than previous year, but has been very dry. (3) TR 077 261, Romney Warren local nature reserve, 21 plants, light grassland, sandy terrain. Just outside SSSI, area usually mown by KWT, but this time omitted.
Dungeness	TR0817		19 June 2010	TI	Odd plants outside the Bird Observatory garden, where it was originally **planted** several years before. A number of plants were produced away from the original location. Not seen in 2014
Littlebourne	TR15Y		After 1970, before 1981	Philp (1982)	Woodland ride. Previously recorded here, presumably at TR1857, by Francis Rose (1954-63) and probably Thomas Johnson (1632) – see text of account above. [Not found in Philp (2010) survey, nor found on search in 2012, when agriculture adjoining the wood was found to have been intensive, which could have affected marginal habitat.]
Sandwich Bay	TR3561	SSSI and KWT reserve	(1) 12 July 2024 (2) 8 July 2021 (2) 23 September	(1) HSt (2) SB (2) KBRG	(1) total of 76 flowering plants counted in usual area. (Only 4 counted in 2023). Recorder reports

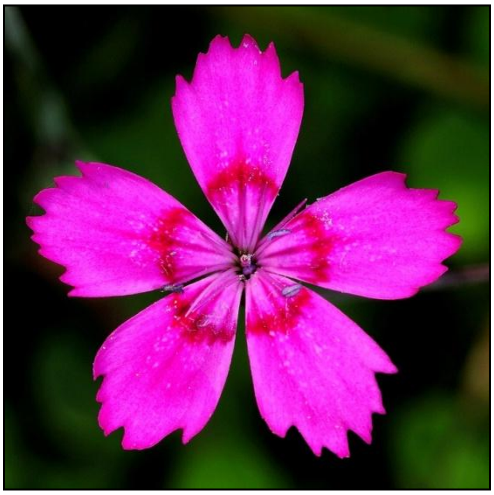
			2015 (2) 2011 (3) 9 July 2010	meeting (2) Anon. (3) JA	that there were more plants on the seaward side of the fence and the habitat there still looking good for them. Also found quite a few rosettes. (2) KWT reserve at TR 35144 61855. Individuals of the colony are marked out by numbered plastic labels and and mostly within some prominent blue fencing. Difficult to get much accuracy but it appears there are around 200 plants. (2) A few dead fruiting spikes at TR 35140 61861 with one still with a flower. (2) 750+ plants reported in *Wild Kent* (see above) (3) One flowering plant at TR 35147 61857, another two at TR 3514 6185; supposed that more plants were present elsewhere. See also text of account above. Counts have numbered 50 (1997, Anon.), 41 (1998, PW), 16 (1999, SH), 64 (2000, PF), 48 (2001, PF), 21 (2002, PF), 134 (2003, PF), 153 (2004, PF), 173 (2005, PF), 233 (2006, PF – including one plant noted c.150m south of main colony), 373 (2007), 507 (2008), 750+ (2011). The July/August 2007 count, by MGa, described the population as at TR 351 618, with 373 plants, located in an area of ancient dune pasture/upper grey dune on the seaward edge of the reserve. The area had been winter grazed by cattle in the past but not for previous three years.

Dianthus deltoides L. (Maiden Pink)

vc 15 and 16

Rarity / scarcity status

Maiden Pink is found scattered across England, Wales and Scotland, both as a native and a garden escape. It has declined, although much of this was before 1930. However, its colonies are generally small and so susceptible to habitat change and other risks; it is nationally scarce and regarded as **Near Threatened** in Great Britain as a whole; but **Vulnerable** to extinction in England. In Kent, it is **rare** – or very **scarce** if one includes garden escapes.

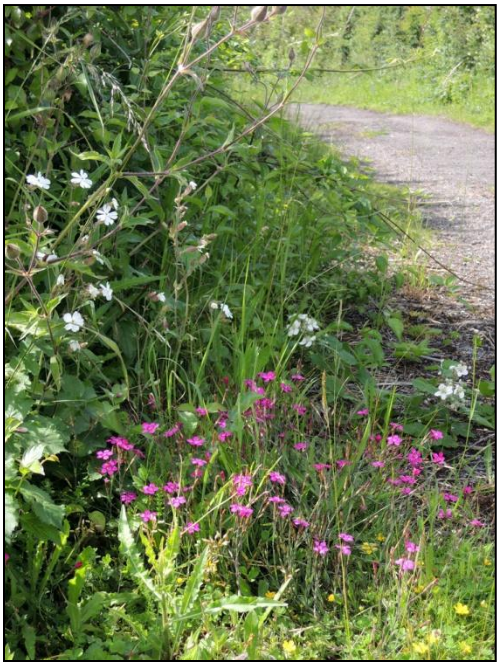


Holborough/Halling. Photo by Lliam Rooney, 19 June 2012

Account

Dianthus deltoides has always been rare in the county, although its first published record goes as far back as Gerard's *Herball* (1597) – where it is mentioned as growing in a field at Deptford. The account of the Deptford Pink (above) describes the confusion between species of Pink which arose subsequently. Hanbury & Marshall (1899) were only able to cite eight other records, mostly historic. There have been relatively few Kent records since. Maiden Pink was present at a disused ragstone quarry at Dry Hill near Sevenoaks (where originally sown) at least between 1954 and 1960, when it was locally abundant, but appeared not to have survived the quarry's conversion into a country park, c. 1972. Writing *c*. 1960, Francis Rose considered it to be probably extinct in the county then as a native and that most sightings were of garden escape origin.

Philp (1982) regarded the species as gone from the administrative county of Kent; but it had then still been present in metropolitan vc16, at Chislehurst. Since 1988 it has been known from a trackside near Holborough Marshes, where it grows by the edge of a track raised above the level of the adjoining Holborough Marshes; the track is of chalk with cinder surfacing, perhaps associated with limeworks activity which took place in the vicinity in the 19th and 20th centuries. It is a loosely tufted perennial and has only been known as a small patch at this location, at most a few plants closely associated. An obvious garden escape or reject was also found in 2013 at Greatstone; a clump of uncertain origin at Betteshanger (formerly Fowlmead) country park in 2014; and a colony associated with the high speed railway works near Ashford in 2014-15 which is presumably related to a 2008 find in similar habitat over 7km away.

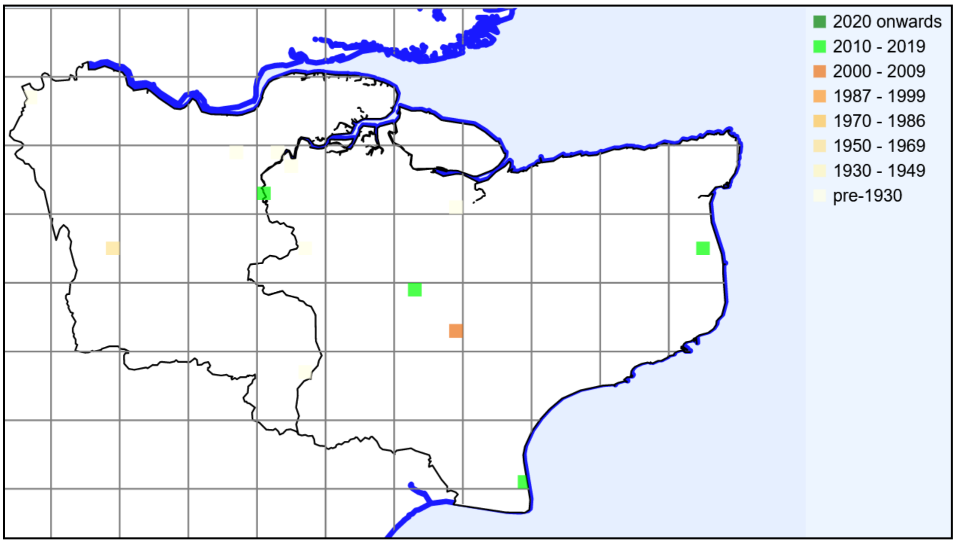


Holborough/Halling. Photo by Lliam Rooney, 19 June 2012

This species favours dry, well-drained, generally base-rich soils with some open or broken ground and recent Kent records have been on sand, shingle, colliery spoil and chalk/cinders.

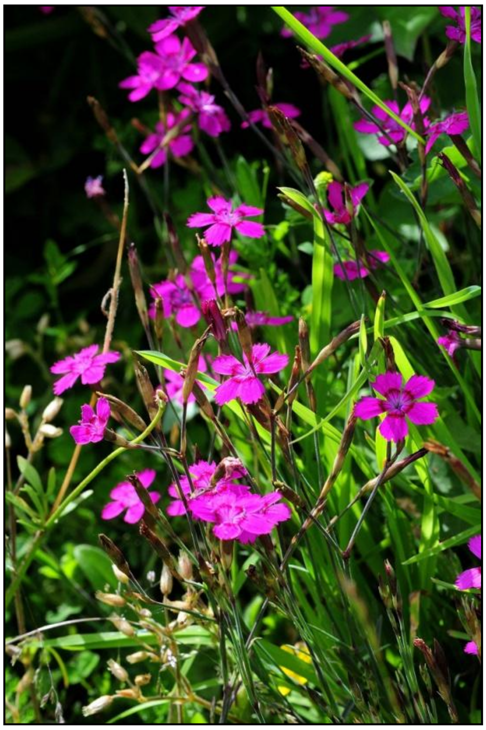
It is distinguished from other British pinks by its hairy inflorescence of solitary (or 2-3) flowers, whose petals have a dark zig-zag band towards the base with white dots above.

***Dianthus armeria* Kent records to 2024 mapped at tetrad level, from BSBI database.**



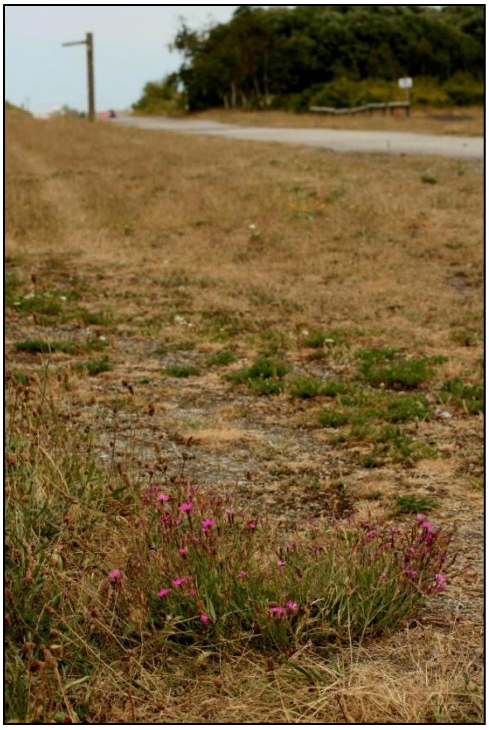
Site	Grid reference	Site status	Last record date	Recorder	Comments
Chislehurst Common (metropolitan vc16)	TQ4469		1990	JBel	Near the Cockpit, conf. JW, known for over 40 years.
Holborough / Halling	TQ67063		(1) 7 June 2014 (2) 19 June 2012 (3) 30 June 2010 (4) 1988	(1) KBRG meeting (2) GK & LR (3) SB (4) GK	(1) Usual site. (2) TQ 70855 63006, edge of made track, on ground slightly raised above adjoining marshes, several plants spread over c. 2.5m length. (3) TQ 70851 63008, Plants covering about 2 square metres of path-side. [Not seen, June 2023, ME.]
Hurst Wood, Charing Heath	TQ9248		(1) 24 June 2018 (2) 11 June 2017 (3) 7 June 2015	(1) SL (2) DCh (3) KFC meeting	(1) Proposed extension to Hurst Wood, Charing Heath (AS68), KWT survey, unmanaged grassland with encroaching scrub on north bank of HS1. Widespread across grassland ranging from single flowers in more enclosed scrubby areas to patches of 50-100 flowers in more open grassland. TQ 92939 48483: 20+ flowers, TQ 92953 48473: 1 flower, TQ 92927 48497: 3 flowers, TQ 929134 85500: 8 flowers, TQ 92897 48514: 10 flowers, TQ 92897 48514: 15 flowers, TQ 92887 48513: 14 flowers, TQ 92852 48529: 50+ flowers, TQ 92857 48510: 30+ flowers, TQ 92873 48505: large patch, TQ 928824 8502: large patch, TQ 92834 48576: 50+ flowers(dense patch), TQ 92833 48554: large patch by horse paddock and other large patches nearby. (2) TQ 92911 48502, several plants on the north-facing slope as well as the south-facing. (2) Seen at TQ 92875 48545, with several other colonies scattered in

					the vicinity across a south-facing sandy slope, associated with the HS1 railway line construction. Original sighting was by MP. A subsequent viewing by MP, JP and AG on 29 August 2014 led to the conclusion that this was likely to be the identity of the plant, when one specimen, past its best, was seen at TQ 9302 4841. The KFC meeting was arranged as a follow-up.
Lodge Wood, Ashford	TQ9943		30 October 2008	PS	TQ 9918 4385, apparently associated with HS1 railway line.
Greatstone	TR0821		27 June 2013	OL	Around 100 flowering shoots in three loose patches on the shingle behind Leonard Road, TR 08209 21177, next to other species of hortal origin, but not recognized as emanating from the nearest garden by the householder.
Betteshanger (formerly Fowlmead) Country Park	TR3554	Owned by Hadlow Group and managed as a country park	22 June 2014	AB	TR 3580 5415, a clump growing beside the track in Betteshanger (formerly Fowlmead) C.P. in very dry short grass. Substrate is very free-draining colliery spoil.



Holborough/Halling. Photo by Lliam Rooney, 19 June 2012

Betteshanger (Fowlmead). Photo by Alan Blackman, 28 June 2014



Drosera rotundifolia L. (Round-leaved Sundew)

vc 15; gone from vc 16

Rarity / scarcity status

Drosera rotundifolia is a fairly common plant of bogs, damp acid heath and moorland in the British Isles, except for south east England, where it has always been less frequent, but has declined in any event, largely due to habitat destruction. Its Great British conservation status is of 'Least Concern', but in England it is **Near Threatened**. In Kent, there is now very little suitable habitat, and the species is restricted to one location. It is accordingly classified as **rare**. It is a Kent axiophyte, indicative of good habitat.

Account

Matthias de L'Obel and Pierre Pena in their *Stirpium Adversaria Nova*, dated 1570 but probably published in 1571, gave the first Kent record for *Drosera rotundifolia*[177]. By the time of Hanbury & Marshall (1899) the species was regarded as very local, being known from four general areas. One of these was north west Kent, on the sandy and gravelly commons at Keston, Hayes, Bromley and Chislehurst; another was in the Tunbridge Wells district; another was from there to Ashford, including Hothfield; and the fourth was on the Lower Greensand east of Ashford. The Round-leaved Sundew's presence at these various locations has gradually been reduced. Indeed, although Hanbury & Marshall (1899) listed it for several north west Kent locations, it may already have been reduced there to Keston Bog by the end of the 19th century.

Hothfield. Photo by Lliam Rooney, 15 June 2010

Keston Bog had been a classic locality for this species. Charles Darwin collected material from here for experiments in connection with his work published as *Insectiverous Plants* (1875). His son, Francis, in writing of Darwin's politeness to servants and indifference to household management, mentioned his asking doubtfully ('doubtfully' is very tentative for the master of the house!) whether he might have a horse and cart to send to Keston for *Drosera*[178]. At this location it was still flourishing in June 1968, when Francis Rose noted over 100 plants, the "best for over 20 years". However, even then Keston Bog was changing, particularly with the cessation of grazing following the 1930s, a reduction in water supply and the growth of conifers; and Sundew was gone by 1987.

Hothfield. Photo by Lliam Rooney, 2 September 2011

The Tunbridge Wells area probably bore most of its historic *Drosera* populations to the south, in East Sussex. One such locality was at Hawkenbury Bog (TQ5937), sometimes taken to be in Kent, but actually within vice county 14, East Sussex, a site which was only the size of "a large room" surrounded by farmland, and hence sensitive as a viable habitat; stock-grazing ceased, it became over-vegetated and dried up, with the loss of this and other bog species.

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[177] David Pearman and Philip Oswald in their note, A very early *Drosera* record, *BSBI News* (2015) **129**: 46-7, suggest that both the text and the accompanying drawing in *Stirpium Adversaria Nova* point to *D. intermedia* (Oblong-leaved Sundew) rather than *D. rotundifolia.* They relate this to the presence of *D. intermedia* in Somerset, although *Stirpium Adversaria Nova* refers to both Somerset and Kent, and *D. intermedia* has not been recorded in Kent. It is perhaps more likely that L'Obel and Pena conflated the two Sundews in their distributional information, rather than that this is a Kent record of *D. intermedia*.

[178] Darwin, Francis, ed. 1887. *The life and letters of Charles Darwin, including an autobiographical chapter*. p138.

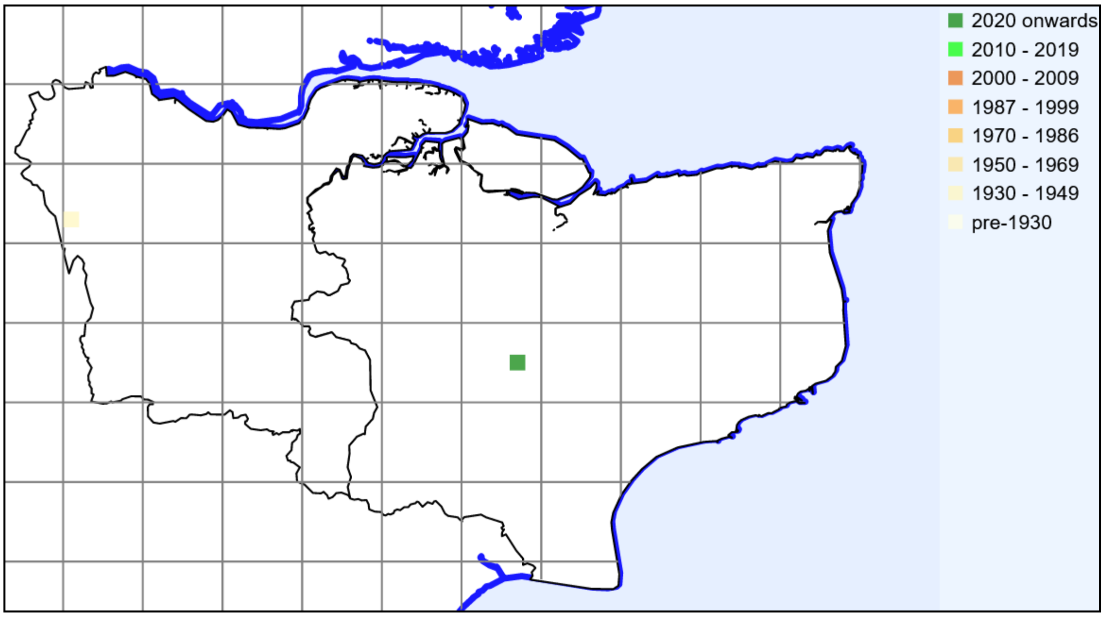
The sites between Tunbridge Wells and Ashford were few and scattered, but included Louisa Lake at Bedgebury, from which the species has gone, and Hothfield Common, where it has been recorded at least back to 1848 and where it is still fairly plentiful, over the main bog. This is now the last surviving Kent site (TQ9645), noted by Alex Lockton as 'thriving in bogs 2 & 3, but seemingly absent from 1 & 4'.[179] Recent sample records (July 2019) include presence at TQ 9682 4565 and TQ 9697 4568; the most recent record is June 2022.

Hothfield. Photo by Lliam Rooney, 4 July 2010

Locations east of Ashford (Willesborough Lees and Westenhanger) do not seem to have generated records since the end of the 19th century other than Gibbin's Brook near Westenhanger, where Round-leaved Sundew was recorded by Francis Rose as very rare in *Sphagnum* at the margin of poor fen in 1945 and has disappeared since.

The Round-leaved Sundew is an insectivorous perennial, requiring wet acid ground, often with *Sphagnum* cover and having an open aspect. It is very susceptible to drying out, and so at Hothfield is reliant upon the continuation of water seepage arising at the junction of the sands of the Folkestone Beds and the clays of the Sandgate Beds.

***Drosera rotundifolia* Kent records to 2024 mapped at tetrad level, from BSBI database.**



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[179] Lockton, A.L. (2022). *The Flora and Vegetation of Hothfield Heath.*

Dryopteris aemula (Aiton) Kuntze (Hay-scented Buckler-fern)

vc 15 and 16

Rarity / scarcity status

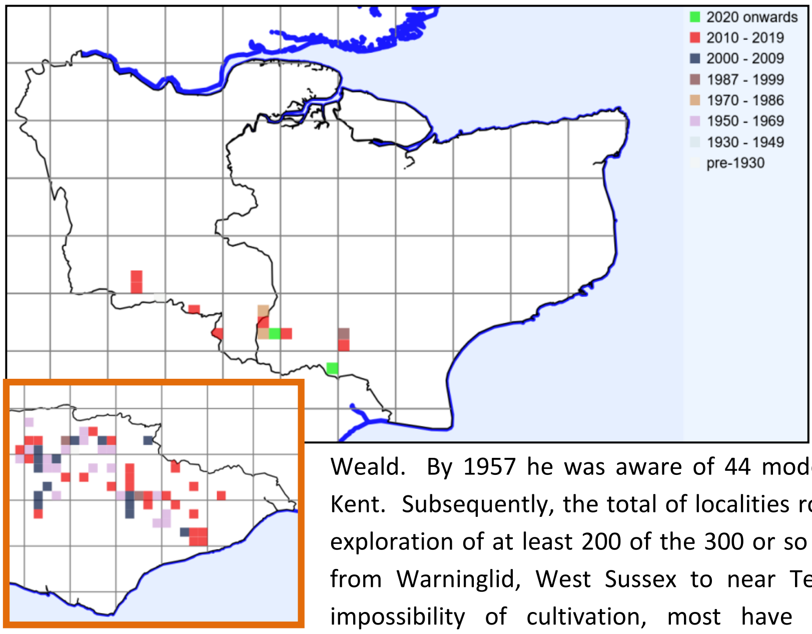
Dryopteris aemula is primarily a plant of western Britain, from Cornwall to the Orkneys, and Ireland. Whilst it is a local plant, the extent of this distribution renders its English and Great British conservation status as of 'Least Concern'. In the south-east, however, its distribution is restricted to ravines in the Weald which replicate climatic conditions further westwards. Its Kent stations are few, and it is **scarce** in the county. It is a Kent axiophyte, indicative of good habitat.

Benenden. Photo by Lliam Rooney, 1 February 2012

Account

The first published Kent record for the Hay-scented Buckler-fern may be in Edward Jenner's *Flora of Tunbridge Wells* (1845), but as this refers to the species being at "Eridge Rocks plentifully, and elsewhere, but not common", it is possible that he could have been referring only to Sussex locations. It was at least subsequently present on the Kent side of the vice county boundary at Tunbridge Wells, as a record for a bog under rocks at Fisher's Castle was contributed to Hanbury & Marshall (1899), who rated the fern as very rare.

The Kent distribution of *Dryopteris aemula* was not elucidated until the researches of Francis Rose from the 1940s onwards, as a result of which it is known as having a Wealden distribution primarily in Sussex, but extending into south Kent. Philp (2010) listed six tetrad records, slightly down from eight in Philp (1982). However, the 2010-23 Kent records (thanks largely to investigations by Stephen Lemon) amount to nine tetrads (ten monads), so there does not seem to be an issue as regards decline.



***Dyopteris aemula* Kent records to 2024 mapped at tetrad level, from BSBI database.**
Inset is the corresponding map of East Sussex records, demonstrating the more extensive presence in the Sussex Weald

Francis Rose[180] found that the fern was frequent, widespread and at times very abundant in suitable habitats in the High Weald. By 1957 he was aware of 44 modern localities, of which five were in Kent. Subsequently, the total of localities rose to over 100[181], as a result of the exploration of at least 200 of the 300 or so gills (steep-sided ravines) extending from Warninglid, West Sussex to near Tenterden in Kent. Because of the impossibility of cultivation, most have remained as woodland, although sometimes converted to plantations. These shaded gills provide a sheltered microclimate with higher humidity and lower temperatures in summertime than on the surrounding plateaux. They accordingly replicate climatic conditions which are to be found in western Britain and Ireland, the main areas of distribution for *Dryopteris aemula,* both in terms of the British Isles and world distribution generally. However, taking the Weald overall, spanning Sussex as well as Kent, its local abundance here can exceed other parts of its range, such as North Wales[182]. The significance of the species in relation to this habitat is such that Philp Sansum has suggested that it should be treated as the 'flagship species' for High Weald gill woodland[183]. It has potential for use as a monitoring species for signals of wider change in gill woodland ecology, whether climate change, woodland management or unforced natural population fluctuations.

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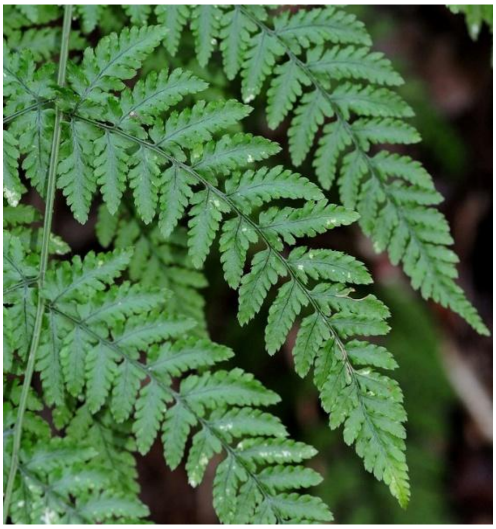
[180] *Dryopteris aemula* in S.E. England, *Proceedings of the Botanical Society of the British Isles* (1958) 3: 100-101.

[181] Francis Rose, *The Habitats and Vegetation of Sussex* (1995).

Woodland gill habitat, Ashour Wood. Photo by Stephen Lemon, 9 July 2016

In the High Weald, the fern is most often found on deeply shaded steep gill slopes facing north or north east, on a well-drained but moist acid substrate, either massive sand-rock or rocky sandy banks. It is associated with a bryophyte flora which reflects a similar climate-related distribution, and is often accompanied by other ferns: *Athyrium filix-femina* (Lady-fern), *Blechnum spicant* (Hard-fern), *Dryopteris dilatata* (Broad Buckler-fern), *Dryopteris affinis* (Golden-scaled Male-fern) and *Dryopteris borreri* (Borrer's Male-fern). Other associates include *Vaccinium myrtillus* (Bilberry) and *Luzula sylvatica* (Great Wood-rush). The presence of the bryophytes *Hookeria lucens and Plagiothecium undulatum* (both 'ancient woodland bryophytes') near the fern in Parsonage Wood and Robin's Wood respectively is of significance as regards the antiquity of the gill woodland habitat.



Benenden. Photo by Lliam Rooney, 1 February 2012

Angley Wood. Photo by Lliam Rooney, 12 July 2015

Francis Rose gave *Dryopteris aemula* as most frequently occurring under the shade of oak, although quite often under beech. Holly and yew may be present, but not as a dense canopy, in spite of the fern's predilection for shade — Sansum (2014) comments on the holly association, which he found frequent, and how this may afford some cold protection, but that the fern appears to avoid the very darkest areas under their crowns. Coppice canopy does not appear favourable, perhaps because of the cyclical disturbance producing higher light intensity, although *Dryopteris aemula* has been recorded at Robin's Wood, Cranbrook under the shade of sweet chestnut. Coppicing at Robin's Wood, where the cutting of a strip of woodland under pylons to the edge of a gill stream with stems and brash left within centimetres of one colony (observed 2014) offered an opportunity of ascertaining the effect of such disturbance.

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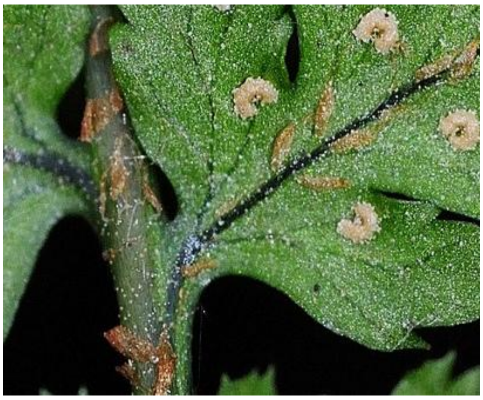
[182] T. Rich et al., Flora of Ashdown Forest (1996).

[183] Philp Sansum, *An overview of the character and ecological significance of gill woodland in the High Weald AONB,* High Weald AONB Unit Commissioned Report (2014). Accessed 9 February 2015 at http://www.highweald.org/downloads/publications/1476-2014-december-overviewofthecharacter-ecologicalsignificanceofgillwoodlandinthehighwealdaonb-drphilsansum/file.html.

Dryopteris aemula is distinctive by virtue of the pinnules on the fronds curling upwards at the edges, so that each pinnule is concave above, and the frond as a whole appears crimped or crisped. Also characteristic are the tiny white glands, mostly on the underside of the pinnules. Because of these glands, when crushed or newly dried, the fern smells of new-mown hay (due to coumarin), and hence the name of Hay-scented Buckler-fern. Its markedly fresh, bright green fronds remain green longer than all the other British *Dryopteris* species, unrolling through summer and overwintering until around next May. Chris Page[184] suggests that this may be one the main factors dictating its distribution: the long growing season required for the wintergreen fronds to harden fully means that the fern is mostly absent from places where early winter frosts may interfere with this.



Pinnule underside, showing sori and tiny white glands. Benenden.
Photo by Lliam Rooney, 1 February 2012

Site	Grid reference	Site status	Last record date	Recorder	Comments
Avery's Wood, near Speldhurst	TQ5440		(1) 28 February 2013 (2) 28 February 2009	(1) GK & SK (2) PS	(1) In the upper valley slopes of gill woodland as described in (2) below, but plants recorded as at TQ54111 40673 and TQ54103 40643. The southern location held 3 plants, on vertical mossy west-facing trackway bank. (2) One small plant beside narrow well trodden path through thicket of holly and birch, in a surprisingly flat and disturbed spot beneath mature beech, at TQ54104 40674. Associated spp: *Hyacinthoides non-scripta*, *Thuidium tamariscinum*, *Polytrichum formosum*, *Eurynchium praelongum*, *Luzula pilosa*. A second plant was present on the bank of the same trackway a few metres up-slope to south, in a more typical position.
Ashour Wood, near Bidborough	TQ5443		(1) 11 March 2017 (2) 9 July 2016 (3) After 1970, before 1981	(1) & (2) SL (3) Philp (1982)	(1) Ashour Wood, steep north east facing bank of upper gill stream: TQ 54658 43779. Single plant still present where found on 09/07/2016. No more plants seen on a further search along gill. Fronds infected with virus, which had not attacked nearby *Dryopteris dilatata*. [Plant gone, 30 March 2019, SL.] (2) Steep north east facing bank of upper gill stream, TQ 54658 43779. Only single plant located despite full search of whole gill stream. Growing on slab of sandstone with *Dryopteris dilatata* and *Blechnum spicant* on vegetated/open section of bank, under light shade of *Quercus petraea* and *Betula*

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[184] C.N. Page, *The Ferns of Britain and Ireland* (1982).

					pendula, with adjacent horizontal trunks of dead *Betula pendula* and *Castanea sativa* straddling gill. Immediately adjacent was a section of gill bank densely shaded by *Ilex aquifolium*. In the vicinity of 'atlantic' liverwort *Jungermannia pumila* and restricted/rare bryophytes *Dichodontium pellucidum* and *Plagiomnium cuspidatum* (3) Given as a TQ54L record, but presumably this site; although stated to have gone from near Bidborough in Philp, 2010. Known here by FR in 1945, when considered to be locally abundant, but since then there have been considerable changes to Ashour Wood, including conifer planting.
Bayham Abbey	TQ63N		(1) After 1990, before 2006 (2) 6 September 1990 (3) 26 June 1980 (4) 5 August 1979	(1) EGP (Philp, 2010) (2) FR (3) FR (4) EGP	(2) Stubbs Wood, TQ6537, in deep gill to west, lower down. (3) Clayhill Wood, TQ 653 375, on steep N-facing gill bank on sandstone soil with some small boulders, 17 plants. (4) Shaded gill in wood north east of Bayham Abbey (FR later recollected this as higher up gill than later record, TQ 654 375, by 1990 smothered in brambles). There are earlier records by FR for 1949-60 relating to the east end of Bayham Woods, in a sheltered woodland gill on Tunbridge Wells Sand.
Near Matfield	TQ64K		n/k	FR	The map which Francis Rose prepared for his MS Flora of Kent includes this tetrad. However, not re-found in the TQ6540 gill west of Matfield, nor the western arm of the gill east of Romford, TQ6440/1 (2016, SL).
North west Lamberhurst	TQ6537		28 March 2016	SL	Clayhill Wood / Stubb's Wood, ghyll stream running west to east. TQ 65226 37510 to TQ 65233 37517: stretch of ghyll stream with strong colony (c. 50 plants?) hanging from and spread across both north and south facing banks of ghyll (best developed in area of north east facing bank). A short stretch where the banks of the ghyll stream become more steep/incised (especially the north facing bank), where large sandstone boulders outcrop (Ashdown formation?). TQ 65233 37517: cluster of four outlying plants up slightly shallower south facing bank here. TQ 65283 37505: four plants further upstream (east), where ghyll stream banks shallow and here confined to immediate edge of ghyll stream. TQ6 5455 37544: 3 plants roughly on west bank, in similarly steep/incised stretch of ghyll stream banks further upstream to main colony. TQ65464 37560: further 3 plants facing west in upper stretch of gill stream with similarly incised/steep banks to main colony, near

					Polystichum aculeatum. Commonest associates *Blechnum spicant* and the moss *Mnium hornum*. Surrounding old coppice woodland mostly bare ground with very impoverished flora. The Atlantic byrophyte *Hookeria lucens* here by a rock waterfall in small form, as well as *Scapania undulata* and *Fissidens pusillus* on rocks in ghyll stream. A mature *Taxus baccata* and *Ilex aquifolium* grow side by side at edge of ghyll stream, with *D. aemula* immediately upstream and downstream of these but not in stretch under their shade. Other trees on ghyll stream banks around main colony Beech, *Quercus*, *Betula*, Hazel, Sweet Chestnut.
Chingley Wood	TQ6833		28 July 1999 and 7 June 1986	JP	
Chingley Wood	TQ6933		(1) 22 August 2019 (2) 11 August 2018 (3) 9 April 2016	(1) SL (2) KBRG meeting (3) SL	(1) Chingley Wood, mixed woodland at headland of ghyll, TQ 692 334. Plants scattered along the top of the eastern bank of the ghyll stream. (2) Chingley Wood. (3) Chingley Wood. TQ 69257 33487: Nine plants along bare north west bank of upper (main) ghyll stream, upstream from brick ruin. T Q69232 334445 to TQ69235 33429: 21 plants in fork of narrow deeply incised upper ghyll stream (19 spread over on NW facing bank, 2 low down near water on opposite bank), associates *Scapania undulata* and *Fissidens pusillus* (on stones in ghyll), *Thuidium tamariscinum, Mnium hornum, Pellia epiphylla, Bluebell, Blechnum spicant, Dryopteris dilatata*, Hazel, Oak. TQ6921 3345: Two plants on flattish ground beside flush at junction with main ghyll stream with *Sphagnum inundatum* and *Polytrichum commune*. Yew and Holly trees centered along ghyll stream separating the colonies *with D. aemula* absent from their shade. Atlantic species *Hyocomium armoricum* and *Hookeria lucens* also present lower down along ghyll stream but not found with *D. aemula.*
Angley Wood	TQ7635		(1) 12 July 2015 (2) 8 March 2013	(1) KBRG meeting (2) SB, LR, JA	(1) Colony seen in 2013 re-found. (2) About 100 plants in Angley Wood in scattered groups around TQ 76110 35850, on banks under oak around the confluence of two gill streams.
south Cranbrook	TQ7634		(1) 16 June 2014 (2) After 1990, before 2006	(1) PS (2) EGP (Philp, 2010)	(1) Several groups of ferns in Robin's Wood, totaling 126 plants: (a) TQ 76323 34168 ±7m: 17 plants on steep (>60° slope) mossy N-facing bank 3m high (+ 13 outlying plants scattered in the immediate vicinity). (b) TQ 76483 34091 ±6m: 9 plants on steep gill bank c.5m high, N-facing, under *Quercus petraea* and

					Ilex aquifolium. Bank v mossy with *Mnium hornum*, *Plagiothecium undulatum* and *Blechnum spicant.* (c) TQ 76505 34084 ±6m: 18 plants. Steep 4m high bank descending to edge of gill stream. Plants within 3m of water in shade of *Ilex aquifolium*. (d) TQ 76520 34080 ±6m: 20 plants, N-facing sandrock bank of gill (+ 6 plants on opposite S-facing bank). Wood recently cut to edge of bank under pylons leaving plants near top in sun. (e) TQ 76541 34071 ±7m: 25 plants mixed with *D. dilatata* on steep NE-facing bank under *Castanea sativa*. Ground cover of *Mnium hornum*. (f) TQ 76581 34017 ±6m: 17 plants in similar situation to last. (2) Philp (2010) gives TQ73S, which corresponds to 2014 finds, but a specimen in MNE (EGP & JBe) dated 29 November 1992 refers to a woodland gill at Robin's Wood, TQ73R. The wood extends into both tetrads. The species has been recorded at Robin's Wood at least back to 1955 (FR, in deep shaded gill on Tunbridge Wells Sand).
Parsonage Wood, White Chimney Wood	TQ7932		(1) 12 November 2023 (2) 25 March 2017 (3) 15 August 2015 (4) 17 June 2014 (5) After 1990, before 2006 (6) 28 August 1988	(1) SL (2) KBRG / KFC meeting (3) BPS meeting (4) PS (5) EGP (Philp, (2010) (6) EGP	(1) (a) Parsonage Wood,m TQ 79817 32955. Eastern branch of ghyll stream. At least 3 plants on north facing bank. (b) TQ 797893 2793. 3 plants on high shady promontory above north facing bank of main ghyll stream. 1 plant under ash tree further down on north facing steep bank. (c) TQ 79789 32937. At least 7 plants on steep northern bank of eastern branch of ghyll under shade of Beech and Holly. (2) 10 plants in deep gill in Parsonage Wood TQ 79802 32948. (3) TQ 79023 32534, one plant at White Chimney Wood, comm. PA, confirming a find by PR on 1 July 2015, found growing on the north bank of the stream after it turns at the north end of the wood. (4) A total of 29 plants in Parsonage Wood, grouped as follows: (a) TQ 79777 32816 ±12m: five plants, base of N-facing bank in heavy shade of large *Fraxinus excelsior*. (b) TQ 79770 32873 ±20m: one large plant on damp E-facing rock exposure, covered in thalloid liverworts, close to gill stream. (c) TQ 79782 32929 ±8m: 13 plants in deep shade on NW-facing gill bank under *Fagus sylvatica* and *Ilex aquifolium*, with sparse *Blechnum spicant* and *Dryopteris dilatata.* (d) TQ 79804 32951 ±6m: seven plants in narrow defile of gill side-arm (four on steep banks, three at base of small cascade/dripping ledge) with a 50cm patch of

					Hookeria lucens directly beneath. (e) TQ 79769 32909 ±14m: three plants in a lush mixed stand of ferns with *Dryopteris dilatata*, *D. affinis*, *Blechnum spicant* and *Athyrium filix-femina.* (5) TQ63W (6) Shady gill, given as TQ73W. The species has been recorded here at least since 1957 (FR – abundant in moist shady gill on steep sandy banks). Subsequently recorded by FR in 1958 (rocky banks in gill on Ashdown Sand), in January 1966 (TQ7932) and in April 1966 (gill head). Babbs Gill, Scullsgate (FR, 1949, 1950) may be this or a neighbouring site.
Benenden	TQ8032		(1) 12 December 2011 (2) After 1990, before 2006	(1) SB (2) EGP (Philp, (2010)	(1) Approx 50 plants on steep bank directly above a stream in a woodland gill at TQ 80328 32605. Same site as photographed by LR in 2012 – see account above. (2) Recorded as TQ83B. Probably the same site as recorded by FR in 1956 as on sandstone rocks and soil in shade by stream in a gill north east of Stream Farm.
Wittersham	TQ82Y	June 2021	(1) June 2021 (2) 4 March 2017 (3) After 1990, before 2006	(1) PSm (2)SL (2) EGP (Philp, (2010)	(1) TQ8927, 11 fronds in a loose group on north west facing slope of steep gulley, with 12 more on opposite bank congested with *Blechnum spicant*. (2) Church Wood, deep narrow gill off the main gill stream, north west facing slope dominated by *Blechnum spicant*, TQ 89933 27986: seven plants in loose group, single plant immediately below these at the edge of the stream. TQ 89942 27987: single tiny outlying plant. *Hookeria lucens* in same vicinity as fern, further up on same north west facing bank. (3) South-facing bank of gill woodland, probably c. TQ 899 279. [Gill woodland under threat from felling, 2023.]
Finchbourne Wood, Tenterden	TQ9031		4 March 2017	SL	Finchbourne Wood, western gill, north-facing vertical cliff of Ashdown Sandstone forming a narrow 10+ metre deep gorge with waterfall, TQ 9084 3162. Single small plant confirmed, possibly two or three further inaccessible plants high up on the cliff face. Associate bryophytes on rocks below in stream: *Calypogeia mulleriana, Tetraphis pellucida, Fissidens pusillus, Dichodontium pellucidum, Dicranella heteromalla*. One plant also seen in Finchbourne Wood, by FR in December 1966, with the moss *Hookeria lucens,* which was growing on moist rocks by a stream.
The Gibbet, Tenterden	TQ93B		After 1990, before 2006	EGP Philp, (2010)	As well as the Philp (2010) sighting, also recorded in a deep shady gill on Ashdown Sand north east of The Gibbet by FR in 1962.

Kent Rare Plant Register
Species accounts Part E

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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Epilobium palustre L. (Marsh Willowherb) 19
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Equisetum sylvaticum L. (Wood Horsetail) 32
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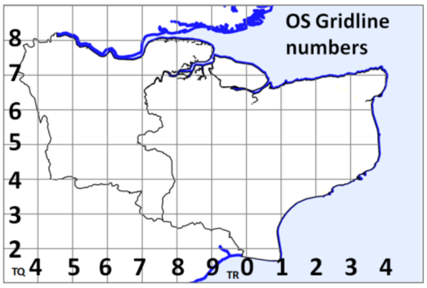
The register formerly included the following species account which may now be found at **Appendix A** of the register, https://bsbi.org/kent: *Euphorbia paralias* (Sea Spurge)

Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at **tetrad** (2 x 2km squares) or **monad** (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AB Alan Blackman
AC Andrew Craven
ACla Ann Clarke
AG Alfred Gay
AH A.C.B. Henderson
AL Alex Lockton
AS Alan Showler
AW Tony Witts
AWr A. Wright
BB Brian Banks
BBe Brian Benatt
BF Brian Ferry
BG Bob Gomes
BS Bob Smith
BW Brian Woodhams
CAS Clive Stace
CH C. Harris
CJC & AP James Cadbury & A. Parker
CP Chris Pogson
CPe C. Pestell
CR Chris Rose
DC David Carder
DCh David Chambers
DG Doug Grant
DJ David Johnson
DM Daphne Mills
DN David Nicolle
DS David Steere
DW D. Worsfold
EB Enid Barrie
EGP Eric Philp
ES E. Scott
FB Fred Booth
FJR Fred Rumsey
FR Francis Rose
FRB F.R. Bryson
GH G. Hemington
GK Geoffrey Kitchener
GPS G.P. Smith
GT Gill Tysoe
HS Heather Silk
IR Ian Rickards
JA Jan Armishaw
JBe Jim Bevan
JEL J.E. Lousley
JH J. Hendey
JL J. Lockward
JoG José Gibbs
JLM J. Le Mesurier
JM Joumana Mobarak
JP Joyce Pitt
JRP J.R. Palmer
JS Judith Shorter
JW Jo Weightman
KBRG Kent Botanical Recording Group
L&DH Lorna & Derek Holland
LBB L. Breda Burt
LM Lesley Mason
LR Lliam Rooney
LS Leonie Seymour
MAS Mark Spencer
MB Mervyn Brown
ME Michael Easterbrook
MG Margot Godfrey
MH Margaret Holdaway
MP Mike Porter
MPa Mary Page
MCS Mary Clare Sheahan
MW M. Waite
NH N. Holmes
NS Nick Stewart
OFC Orpington Field Club
OL Owen Leyshon
PA Pat Acock
PAk Peter Akers
PG Peter Gay
PH Peter Hodge
PHe Peter Heathcote
RB R.A. Boniface
RBr Robert Brooks
RC Ray Clarke
RD Dick David
RF Lady Rosemary FitzGerald
RG Bob Gomes
RM Richard Moyse
RMB Rodney Burton
RP R.D. Porley
RR Rosemary Roberts
RS R.M. Stokes
RW R.H. Woodall
SA Sheila Anderson
SB Sue Buckingham
SC Steve Coates
SK Sarah Kitchener
SL Stephen Lemon
SLo Steve Lofting
SP Sue Poyser
TH T.Hurst
TH-D Tom Hart-Dyke
TI Tim Inskipp
WFS Wild Flower Society

Other abbreviations and references:

BPS = British Pteridological Society	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	LNHS = London Natural History Society	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
CROW Countryside & Rights of Way Act 2000	MNE = Maidstone Museum Herbarium	SLBI = South London Botanical Institute
Hanbury & Marshall (1899) refers to their *Flora of Kent*	RNR = roadside nature reserve	

Eleocharis acicularis (L.) Roem. & Schult. (Needle Spike-rush)

vc 15; not seen recently in vc 16

Rarity / scarcity status

Eleocharis acicularis has a scattered but patchy distribution across the British Isles, mostly on pond or lake margins. Its conservation status in Great Britain as a whole does not present any concerns; but in England it is regarded as **Near Threatened**. Kent comprises one of the patches of relative absence. Indeed, it has hardly been seen, and was supposed likely to be extinct, until recorded anew in 2012 and 2016. It is accordingly **rare** in Kent.

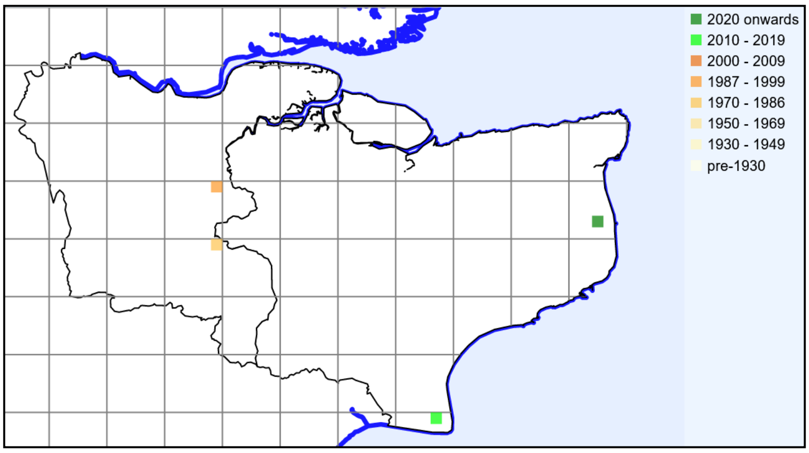
Account

The Needle Spike-rush was not known in the county to Hanbury & Marshall (1899), although considered by the authors as quite likely to occur at the edge of pools on heaths, but to be overlooked due to its inconspicuousness. If one discounts an unconfirmed report from Chislehurst Common, It was first found by Francis Rose, abundant on the gravelly bed and edges of a small pond nearly one mile east of Hale Street, near East Peckham (TQ 683 493). It persisted there from 1954 at least until 1992, but could not be found in 1999. A visit in 2013 (SL) found two ponds, one with dominant *Crassula helmsii* (New Zealand Pigmyweed) around the edges or otherwise occupied by willows, the other nutrient-enriched and surrounded by rank vegetation and woodland. In neither was *E. acicularis* present or likely.

A further record from the middle lake of the group east of Birling Ashes (TQ 689 598) was made in September 1997, determined by N.F. Stewart, but this has not been repeated.

In May 2012, however, the species was discovered by Sue Buckingham (confirmed by Jeremy Roberts, BSBI referee) at Betteshanger (formerly Fowlmead) Country Park, TR 35795 53774, where it was growing vigorously in abundance at the margins of an ephemeral pool on the former spoil tip derived from Betteshanger colliery. Here it had developed turf-like patches as a result of the species' creeping rhizomatous growth. The coal spoil substrate is nutrient-poor, and hence general colonisation by plants of the Country Park is slow, and habitats remain open longer than would otherwise be the case. The colony has persisted (1 July 2023) elsewhere in the same pool (TR 3581 5377), despite the pool having seasonally dried out at the time of visit.

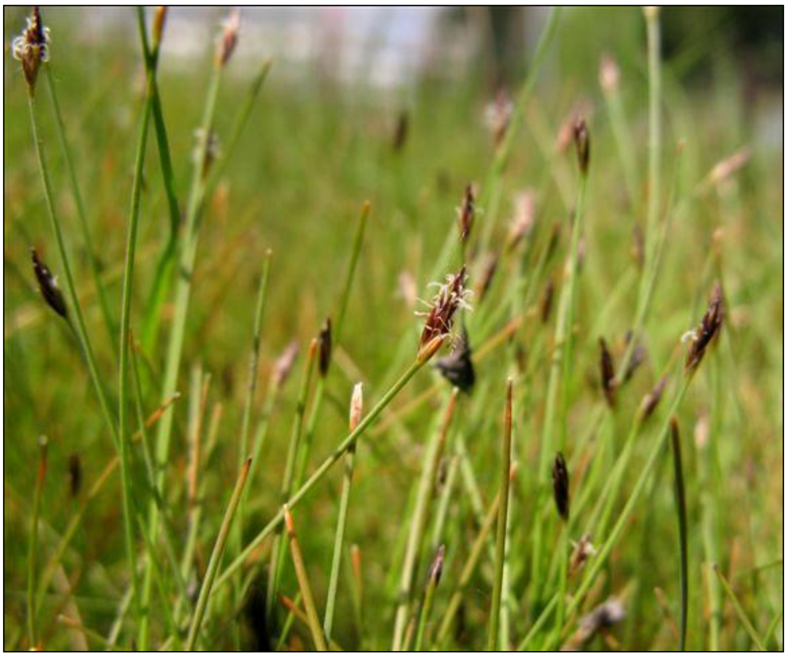
This is an artificial site, where the plant is scarcely likely to have originated from the surrounding marshland, which is at a much lower level than the colliery spoil. It is possible that Needle Spike-rush at Betteshanger (Fowlmead) is an aquarists' introduction. It is a plant favoured for aquascaping, because of its ability to grow totally submerged, presenting a lawn-like appearance in an aquarium. (It may be relevant that a more permanent pond elsewhere in the Park bore in 2012 a flourishing population of goldfish.) Alternatively, it is quite possible that the introduction was by natural means, through wildfowl (seeds of another species in this genus, *Eleocharis palustris*, have been found in wildfowl guts), just as seems likely with the following occurrence.



Eleocharis acicularis Kent records to 2024 mapped at tetrad level, from BSBI database.

A second site was discovered by Sharon Pilkington in October 2016 in a normally 'out of bounds' area (protecting breeding Lapwing) at the Dungeness RSPB reserve in the course of a bryophyte survey of damp sand habitats. There was quite a substantial population, growing submerged in shallow water in a sheltered corner of a gravel pit, TR 0729 1929. There were no flowers/fruits but a dense 'lawn' of leaves, some of which were detached and floating together with their rhizome. She surveyed a number of other pit margins that day, but found the extent of *Crassula helmsii* (New Zealand Pigmyweed) was such as would be likely to limit opportunities for the spread of the *Eleocharis* elsewhere. This colony looks to be one more likely to have arrived through the agency of wildfowl than alternative modes of transmission.

Eleocharis acicularis is a tufted perennial, shorter and more slender than such similar species as *E. multicaulis* (Many-stalked Spike-rush) and *E. quinqueflora* (Few-flowered Spike-rush). The Betteshanger (Fowlmead) plants were (at 0.4mm stem diameter) not quite as slender as the norm for this species, apparently associated with their general vigour. The lowest glume of *E. acicularis* does not completely surround the base of the spikelet, as it does with those similar species. That glume is normally empty, but Betteshanger (Fowlmead) material included spikelets with a flower in the lowest glume.



Betteshanger (Fowlmead), Deal. All photos by Sue Buckingham, 16 May 2012

Eleocharis multicaulis (Sm.) Desv. (Many-stalked Spike-rush)

vc 15 and 16

Rarity / scarcity status

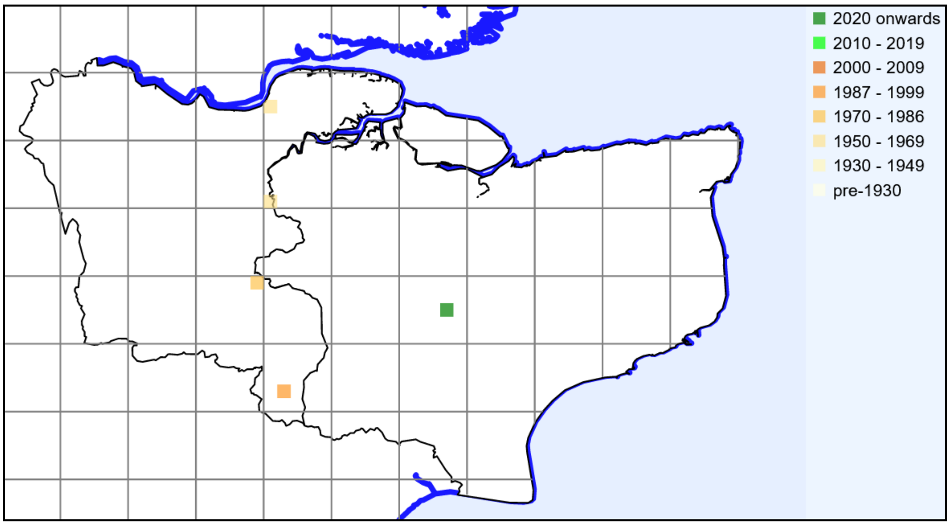
Eleocharis multicaulis is a small tufted perennial, common in wet acid places in western Britain and Ireland, but sparse in eastern parts. There are no conservation concerns in Great Britain overall, nor in England, and its risk status is regarded as of 'Least Concern'. In Kent, however, it is reduced to two localities (in one of which it has not been recorded recently), and is **rare**. It is classified as a Kent axiophyte, indicative of good habitat.

Hothfield. Photo by Lliam Rooney, 19 June 2011

Account

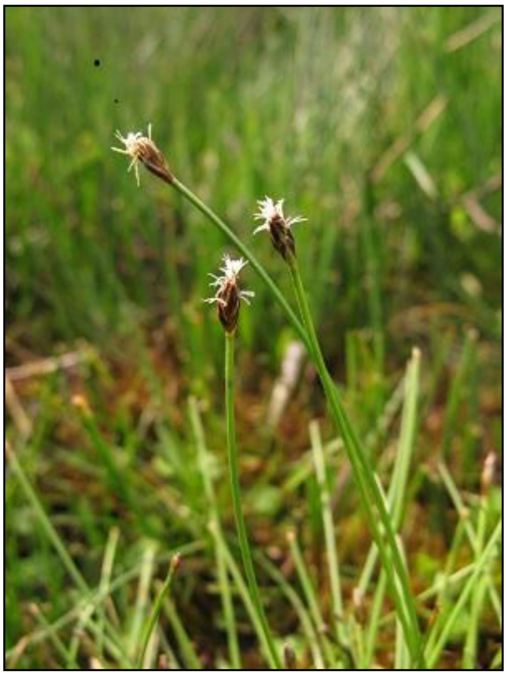
M.H. Cowell first purported to record *Eleocharis multicaulis* in Kent, as to be seen in June in terrain bordering Oare Creek and at The Brooks near the Barn, Bysing Wood, Faversham (*A Floral Guide for East Kent, etc.,* 1839). Some doubt has been expressed as regards his identification, and as to whether *E. quinqueflora* (now extinct in Kent, but more appropriate in a saltmarsh environment) might have been involved. Hanbury & Marshall (1899) regarded *Eleocharis multicaulis* as rare in swampy places, especially on heaths, and gave a few widespread locations, including at Hothfield Heath, where one at least of the joint authors observed it.

It has remained rare in Kent, and in Philp (2010) it is given as only recorded in wet boggy areas at Hothfield Common and on the edge of Louisa Lake, Bedgebury Forest (where it was also seen by Francis Rose in a floating sphagnum mat around 1947). A few plants at the gravelly edge of a small pond at East Peckham were also noted in the earlier survey published as Philp (1982), but not subsequently. Plants at Hawkenbury Bog (sometimes credited to Kent, but actually in East Sussex, vc14) were lost with the decline of the habitat there and those at Keston Bog were gone at some point after 1963, when seen by Francis Rose. Our 2010-24 records are limited to Hothfield.



***Eleocharis multicaulis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The distribution map shows (faintly) a couple of old records, which are probably best ignored. They represent finds in the 1960s by R.D. English at Higham Marshes (TQ 710 744) and New Hythe (TQ 710 603). Although R.D. English was a frequent correspondent with Francis Rose at the time, the records do not figure in the latter's manuscript *Flora of Kent*; he rejected other records from coastal or estuarine habitats on the basis that they probably referred to *Eleocharis uniglumis* (Slender Spike-rush). Appropriate habitats he considered to be pools of valley bogs and swamps, always in fairly acid waters (pH 4.5-5.5).



Hothfield. Photo by Sue Buckingham, 29 May 2012

In the Netherlands and Belgium[185], it is regarded as performing best in wet acid environments with an organic top layer; high atmospheric nitrogen deposition is detrimental because the resulting strong acidification leads to dominance of the ammomium cation (NH_4) over nitrate (NO_3). It is not a pioneer and so may be found with established vegetation, e.g. *Hypericum elodes* (Marsh St John's-wort) and *Eleogiton fluitans* (Floating Club-rush) – we have the former at Hothfield. The Kent distribution of *Eleocharis multicaulis* is limited by the paucity of good bog habitats.

Eleocharis multicaulis is one of our smaller Spike-rushes, 15-30cm tall, with three stigmas and a lower glume much less than half the length of the spikelet, the uppermost sheath obliquely terminated.

Site	Grid reference	Site status	Last record date	Recorder	Comments
East Peckham	TQ64Z		After 1970, before 1981	Philp (1982)	A few plants on sandy gravel at edge of small pond.
Hothfield	TQ94S	SSSI, KWT managed reserve	(1) 23 June 2022 (2) 11 July 2019 (3) 1 July 2019 (4) 8 August 2015 (5) 25 May 2010 (6) After 1990, before 2006	(1) AL (2) AL (3) AL & JM (4)BW (5) GK (6) EGP (Philp, 2010)	(1) TQ 968 456. (2) TQ 9673 4610 and TQ 9674 4611, Bog 4. (3) TQ 9682 4565, by the board-walk in Bog 2. (4) TQ9645. (5) TQ9645 (also see dates as credited under photographs for other sightings at this location). (6) TQ94S.
Bedgebury Forest	TQ7332		13 July 1991	EGP	

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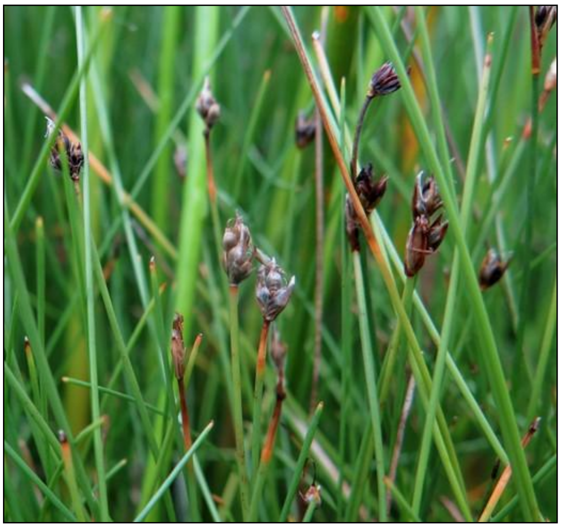
[185] Vanderhaeghe, F., Smolders, A.J.P., Ruysschaert, S., Roelofs, J.G.M. & Hoffmann, M. (2005). Understanding the realised niche of an amphibious softwater plant, *Eleocharis multicaulis*. *Archiv für Hydrobiologie* **163:** 329–348.

Eleocharis quinqueflora (Hartmann) O. Schwartz (Few-flowered Spike-rush)

vc 15

Rarity / scarcity status



Ham Fen. Photo by Sue Buckingham. 26 July 2017

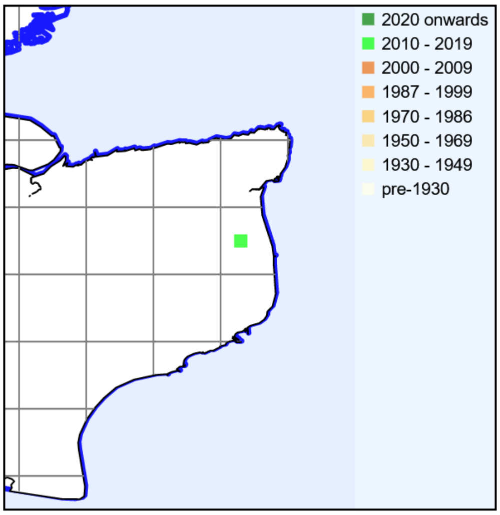
Few-flowered Spike-rush is widespread in the British Isles, at its most common in Scotland, north west England and Wales and more or less absent from central and south east England. Its conservation risk assessment in England and in Great Britain as a whole is one of 'Least Concern', but as it has been lost from over half of its extant 10km square occurrences in lowland England since 1930-60, then this assessment glosses over what must at least be considered an element of concern for its future. There have been hardly any historic records in Kent and it was considered extinct since 1875 until, remarkably, it was rediscovered in 2017 at a site with no records since the 1830s. It must be considered extremely **rare** in the county. It is a Kent axiophyte, indicative of good habitat.

Account

Hanbury & Marshall (1899) attribute the first Kent record to Lewis Dillwyn, as mentioned by Sir J.E. Smith in *Flora Britannica* (1800). This is not quite right, as there is no such record in the 1800 edition of that work, but it was amongst additions made to the 1804 edition by Dr. J.J. Römer, who no doubt acquired the information from Dillwyn's Catalogue of the more rare Plants found in the Environs of Dover (*Transactions of the Linnean Society,* 1802, **6:** 177-184). Dillwyn recorded it as *Scirpus pauciflorus* 'About Ham Ponds' and as his catalogue was presented as a paper to the Society in March 1801, then his sighting cannot be later than 1800. It may well have persisted, as G.E. Smith's manuscript notes (1830-33) to his own *Catalogue of rare or remarkable phaenogamous plants collected in south Kent* (1829) gives the species as 'about Ham Ponds' on the authority of Andrew Matthews, a gardener who was to be employed by the Horticultural Society of London to collect plants in South America and was presumably capable of recognising the species, if he was not just repeating Dillwyn's words. M.H. Cowell, in publishing the Mathews record in his *Floral Guide for East Kent etc*. (1839), placed it at Ham, 'About the Brooks', which Francis Rose equated to Ham Ponds (The East Kent Fens*, Journal of Ecology*, 1950, **38**: 292-301). No other sightings appear to have been made here until 2017.

Ham Fen, habitat. Photo by Sue Buckingham. 26 July 2017

F.J. Hanbury recorded the species at Dungeness in 1875, but other old records have some doubt attached. A specimen in **SLBI** collected by R.R. Hutchinson under this name from marshes at Tenterden in 1898 appears to be *Eleocharis palustris* (Common Spike-rush). A 1903 report by W. H. Griffin at Keston in the *Woolwich Surveys* (1909) appears, from his 1904 specimen at **SLBI**, also to be erroneous. F.M. Webb speculated as to whether a record of *Scirpus multicaulis* (*Eleocharis multicaulis,* Many-stalked Spike-rush) at the Brooks, Faversham (in Cowell's *Floral Guide*, 1839) might have been *Scirpus pauciflorus* (*Eleocharis quinquefolia*), but this is speculation. Perhaps of more credit, Francis Rose (in his MS *Flora of Kent*) considered Marshall's record (in Hanbury & Marshall, 1899) of *Scirpus caespitosa* (*Trichophorum cespitosum,* Northern Deergrass) in marshy ground about a mile north of Sandwich to be almost certainly *Eleocharis quinqueflora*.



Eleocharis quinqueflora **Kent records to 2024 mapped at tetrad level, from BSBI database.**

In summary, the species cannot have been other than extremely rare in Kent and gave every impression of having been long extinct. Then, in July 2017, it was found by Sue Buckingham and Stephen Lemon with others at KWT's Ham Fen reserve. It was spread over an area of about 2 x 4 square metres of calcareous peat at TR 33165 55164. The relevant part of the reserve was, when taken over by KWT some years before, a field of undistinguished rank 'improved' grassland, sloping down from higher ground at its southern end (according to Joyce Pitt). At the lowest part of the field, KWT management had entailed c. 1996-98 (with some re-profiling work continuing at the reserve in 1999 and until 2003) scraping off soils in the parts nearest the stream, with the resultant exposure of the peaty substrate. The original derivation of this substrate will have been from peat formation associated with freshwater lakes related to the Great Stour estuary, when this was much more extensive, coupled with incoming drainage from the chalk. Ham Ponds represented the remains of open water areas and by G.E. Smith's time the area was 'a black boggy, or pasture tract'.

From Ham Fen, fruit. Photo by Stephen Lemon, 19 July 2017

The scraping and re-profiling undertaken by KWT[186] was directed towards enabling fen/marshland communities to re-assemble, recognising that the peat had in places mineralized due to desiccation caused by several episodes of agricultural land drainage. Restoration was perceived as requiring either the raising of water levels, where there were practical limitations, or excavation down to the then current summer water levels; and experimentation suggested that top substrate removal down to 30cm would be most successful. Less would merely result in re-mineralisation of the peat surface. This work seems likely to have exposed the seed-bank, which was since recognised with the recording of *Lysimachia tenella* (Bog Pimpernel) and *Baldellia ranunculoides* (Lesser Water-plantain), and which may have applied to *Carex rostrata* (Bottle Sedge), discovered in the vicinity on the same occasion as the Spike-rush. Water levels have become higher with the introduction of beavers in 2001, active further south along the stream. Their ecological impact has become apparent since 2006-2007 when numbers began to increase, and they have completely transformed more-or-less secondary woodland into an uneven-aged fen mosaic. This is likely to have encouraged the Spike-rush, which provides evidence for the success of KWT's conservation approach.

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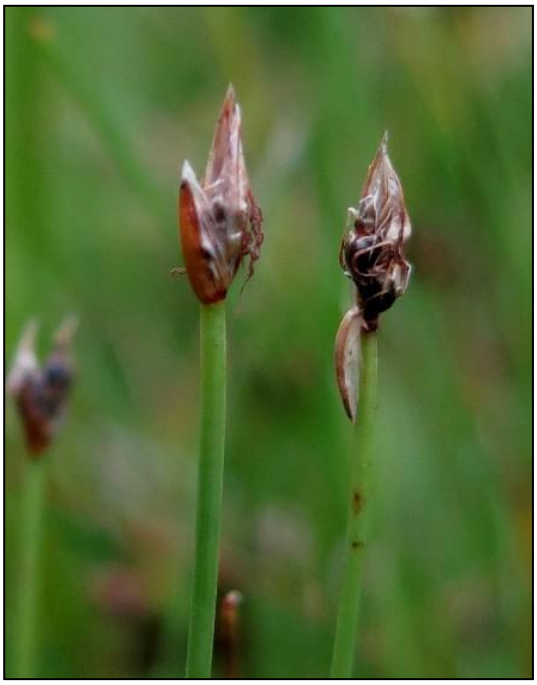
[186] Work details kindly provided by John McAllister.

The dominant associated species were *Juncus subnodulosus* (Blunt-flowered Rush) and *Lysimachia tenella. Juncus articulatus* (Jointed Rush) and *Ranunculus flammula* (Lesser Spearwort) were also frequent and there were also, in lesser quantity, *Carex distans* (Distant Sedge), Carex flacca (*Glaucous Sedge*) and seedling plants of *Lythrum salicaria* (Purple-loosestrife).

Presence of the Spike-rush was again confirmed on 21 July 2018, by a KBRG meeting.

Eleocharis quinqueflora is a plant of wet peaty mires, especially if base-enriched, as with Ham Fen, and it dislikes competition. Compared with many other Spike-rushes its spikelet has relatively few flowers (2-7) and its lowest glume encircles the base and is usually over 2.5mm in length and at least half as long as the spikelet. The characters of the nut are distinctive: black when fresh; three stigmas; and the style base which sits on top has an outline flowing into the nut without a constriction between (this style base character is shared only with *Eleocharis parvula* (Dwarf Spike-rush) among the British *Eleocharis* species).



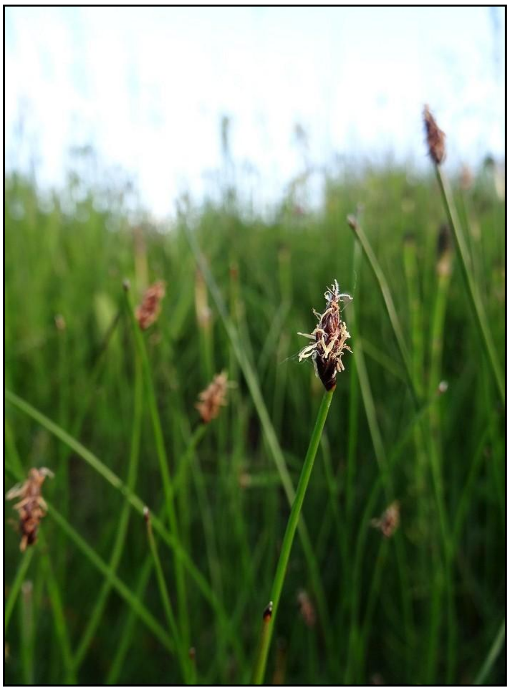
Ham Fen. Photo by Sue Buckingham. 26 July 2017

Eleocharis uniglumis (Link) Schult. (Slender Spike-rush)

vc 15 and 16

Rarity / scarcity status

Slender Spike-rush is not uncommon in appropriate habitats across the British Isles and its conservation status is of 'Least Concern' both in England and in Great Britain as a whole. In Kent, however, there have never been many locations and in the early 21st century it was considered possible that it had gone from the county. It is still present, however, but is **scarce**, verging on **rare**. It is classified as a Kent axiophyte, indicative of good habitat.



Holborough. Photo by Stephen Lemon. 15 June 2013

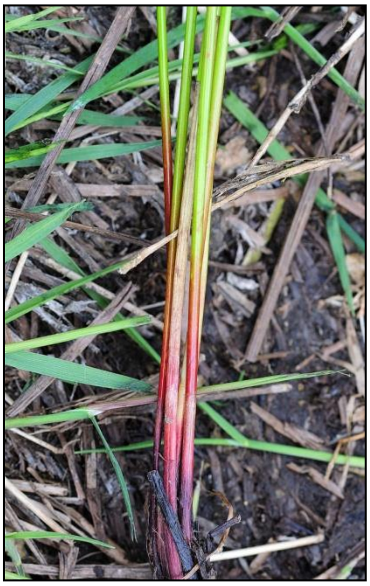
Account

The first reasonably unequivocal occurrence of *Eleocharis uniglumis* in Kent appears to be an 1870 record (published 1871) at Sandhills, Deal by Professor J.F. Duthie, who subsequently became Superintendent of Saharanpur Botanical Gardens. It is cited by Hanbury &Marshall (1899) as the first county record (although they give incorrect dates), but at the same time they also refer to Duthie having found it at Ham Ponds and they list an earlier (1861) specimen from Denge Marsh in John Stuart Mill's herbarium. It is possible that the 1861 record was not thought by Hanbury and Marshall to be sufficiently accredited for citation as a first record. After all, the specimen sheet, which is at Kew, has a label on which Mill marked the identity as '(perhaps)', and it was re-determined by C.B. Clarke in 1987 as *Eleocharis palustris* (Common Spike-rush); it is by no means clearly *Eleocharis uniglumis* (according to Stephen Lemon, who has examined the original), even though the species was found at Denge Marsh in 2018.

Holborough, habitat. Photo by Stephen Lemon. 15 June 2013

There has been a scattering of records across the county since then, at sites such as those known to Francis Rose north of Shoreham (1954), at Stowting (1954) and Foots Cray Marshes (1946-55 and subsequently), all of which appear to have gone. Francis Rose also remarked on the Spike-rush being rare but locally abundant in the Thames-Medway estuary, specifically Shorne and Higham Marshes, and it seems surprising that sightings have not continued there. Philp(1982) noted that the species could not be found in several former sites affected by land drainage or agricultural improvement, and that the 1971-80 county survey could only trace it in the Lydden Valley area and in one meadow at Snodland. In fact, there were two such meadows at Snodland (per Joyce Pitt), but the other has since been lost to development. In the course of the 1991-2005 survey (Philp, 2010), there were no sightings despite repeated search. Accordingly, although Eric Philp had expressed some hope that Slender Spike-rush might yet be found in grazing meadows along the Swale or in the Lydden Valley (to which one might also add the Stour Valley), the species was in 2012 placed on the Kent Rare Plant Register supplement of 'probably extinct' Kent plants.

Then in June 2013, nine patches (the number depends on how one interprets discontinuities) were found by Stephen Lemon at the Holborough Marshes KWT reserve in a damp field which may well represent one of the meadow sites previously noted as at Snodland (Holborough is within Snodland parish). There is probably a history for such a location, as it appears to be one of those studied by Walters (1949)[187] and described as 'Rough grazed brackish marsh, Medway Estuary, Snodland, Kent 2. ix. 47'. The field is subject to increasingly brackish influence where its approaches the tidal Medway flood banks to the east. *Eleocharis uniglumis* grew along the edges of the shallow dry ditches in an old drainage system in the centre of the field, usually where the ground was bare and less dominated by *Juncus* spp. A further survey later that month found that the most consistently associated species were, in order of frequency of association: *Carex otrubae* (False Fox-sedge) and *Equisetum palustre* (Marsh Horsetail) (both present in every case); *Juncus inflexus* (Hard Rush) and *Potentilla anserina* (Silverweed); *Rumex conglomeratus* (Clustered Dock); *Poa trivialis* (Rough Meadow-grass); and then *Alopecurus geniculatus* (Marsh Foxtail), *Elytrigia repens* (Common Couch) and *Holcus lanatus* (Yorkshire-fog).



Holborough , plant showing reddish-purple stem / sheaths base.
Photo by Lliam Rooney, 25 June 2013

Eleocharis palustris (Common Spike-rush) was also present in the field, generally in and beside the wet dykes rather than the shallow dry ditches. However, there was one dried-out ditch with both Slender and Common Spike-rushes present, including some plants of unusual vigour; but no signs of hybridity were identified by Jeremy Roberts (BSBI referee) in material examined by him. Intriguingly, Walters (1949) refers to a west Kent plant which had cytological irregularities, giving haploid numbers varying from n=19 to 24 in the pollen-grain mitoses, seemingly the same plant as regards which he wrote in 1987 (*in litt*.) as on cytological evidence 'probably *palustre* (2n=38) x *uniglumis* (2n=46)'. This putative hybrid may be inferred as having been found at Snodland / Holborough. In spite of the very limited recognition of this hybrid in the British Isles, sterile intermediates have been found by Stephen Lemon in mixed populations at Hacklinge (2018) and Dengemarsh (2019), in both cases with lowest glume encircling the one opposite, or almost so, and both such glumes being empty or infertile.

In August 2016, *E. uniglumis* was found by Stephen Lemon to be still present near Hacklinge, in an area which had been described by Francis Rose in 1950[188] as a tract west of the main road south of Hacklinge Farm, dominated in part by *Blysmus compressus* (Flat-sedge) and *E. uniglumis.* He considered it to be (as at 1950) an area whose vegetation had been modified by grazing and mowing for hay over a long period, dominated largely by grasses and sedges characteristic of moist calcareous soils and subjected to brackish water conditions at some time past. The 2016 rediscovery was in a cattle-grazed, marshy, sedge-rich fen pasture in Ham valley, on the west side of the A258 south of Hacklinge Farm, within Hacklinge Marshes SSSI. Plants were widespread but not obvious, due to heavy grazing, and they were most noticeable in the lush ungrazed growth that fringed the edges of old cow-pats. In June 2018, it was also found in a neighbouring monad. Hacklinge, Ham Fen and, to a lesser degree, the Lydden Valley are associated areas where Francis Rose had known the species to be present. Its presence, however, is wider than this: in June 2020, Stephen Lemon and Sue Buckingham found it further north east, in damp meadows near the Sandwich Bay estate.

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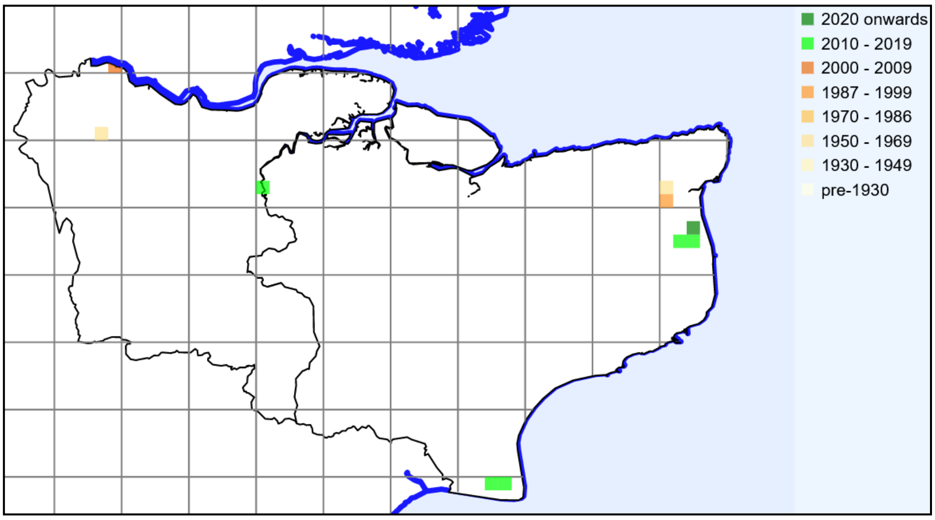
[187] Walters, S.M. (1949). Biological Flora of the British Isles: *Eleocharis* R. Br. *J. Ecol.* 37: 192-206.

[188] Rose, F. (1950). The East Kent Fens. *Journal of Ecology* **38**: 292-302.

Despite the doubtfulness of John Stuart Mill's Denge Marsh 1861 record, the species has been found there by Stephen Lemon in June 2018 and more extensively in July 2019. Plants were by a flooded gravel pit but are likely to have been present in a field here before gravel extraction began.

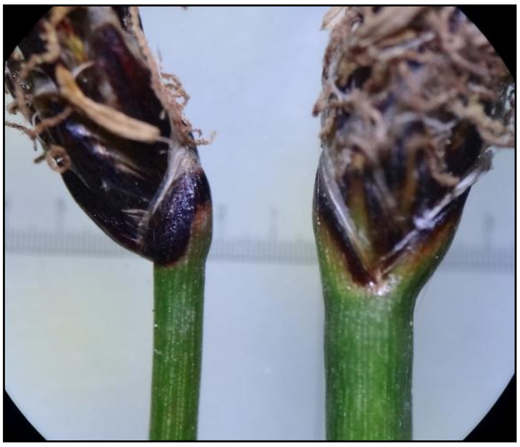
Eleocharis uniglumis Kent records to 2024 mapped at tetrad level, from BSBI database.



Recent records (2010-24) cover six tetrads (eight monads).

Eleocharis uniglumis in Kent has generally been a plant of damp meadows, grazing marshes or fen, often with calcareous influence, as with the Holborough site, Ham Fen/Hacklinge and as is assumed to have been the case with the Shoreham and Stowting sites. It may grow in a near-brackish habitat, but many of its sites are remote from the sea or tidal rivers.

It is a patch-forming perennial, resembling *Eleocharis palustris* (Common Spike-rush), but with thinner stems and with the base of the stems and sheaths reddish-purple (yellowish-brown in *E. palustris*). The lowest glume, which is empty, more or less completely encircles the base of the spikelet, whereas the encirclement of the base of the *E. palustris* spikelet is shared by two empty glumes. The spikelet of *Eleocharis uniglumis* often shows a pronounced lean on one side.



Material from Holborough, showing (left) *Eleocharis uniglumis* with single encircling basal glume and (right) *Eleocharis palustris* with two basal encircling glumes. Photo by Stephen Lemon. 15 June 2013

Site	Grid reference	Site status	Last record date	Recorder	Comments
North Erith Marshes (metropolitan vc16)	TQ4880		3 August 2004	JP	Grazing marsh at TQ 48831 80054.
Snodland	TQ76B		After 1970, before 1981	Philp (1982)	Probably the same site as that at TQ7062 below.
Holborough	TQ7062	KWT managed reserve, SSSI	(1) 13 May 2018 (2) 7 June 2014 (3) 25 June 2013 (4) 15 June 2013	(1) DS (2) KBRG meeting (3) GK & LR (4) SL	(1) Present. (2) TQ 70690 62363, previously found by SL, a small patch mixed with *E. palustris* in low ground of old drainage runnel near *Dactylorhiza* x *kerneriorum*. Also, at TQ 70687 62304, previously found by SL, a patch 1 x 2 metres, *E. palustris* being present a little to

					the south. (3) (a) TQ 70749 62369, 1m x 2m patch by dried-out shallow (east-west) ditch. (b) TQ 70756 62371 to TQ70762 62373, a 2m x 2m patch and then for 4 or 5m along the south side of dried-out shallow (east-west) ditch. (c) TQ 70767 62311, a 3m x 2m patch along the upper edge of dried-out shallow (north-south) ditch. (d) TQ 70763 62321, a 5m x 4m patch along a dried-out shallow (north-south) ditch, *with Eleocharis palustris* at bottom. (e) TQ 70753 62340 (a 2m x 1m patch), TQ 70751 62346 (a 2m x 1m patch) and TQ 70749 62352 (a 2m x 0.5m patch), all along a dried-out shallow (north-south) ditch. (4) TQ 70761 62366, nine patches along a dry ditch system in field centre, usually where ground bare and less dominated by *Juncus* spp.
North east of Queenborough	TQ97G		27 July 1991	JP	Marsh dyke near farm.
Denge Marsh	TR0518	NNR, SSSI	9 June 2018	SL	Dungeness RSPB Reserve, Denge Marsh, small field west of the public footpath containing Denge Marsh hide, bordering eastern corner of the Barge Pit, TR 05878 18310. A few patches along a few metres of damp grassland immediately behind *Phragmites / Bolboschoenus* dominated edge of pit. Specimen confirmed by MP. Associates along edge include *Eleocharis palustris*, *Carex hirta* and *Mentha aquatica*. Base rich nature of substrate here demonstrated by presence of *Chara connivens* in shallow edge of pit. Historic imagery shows this field as a remnant of a larger field that existed prior to creation of the gravel pit and that the area was disturbed by gravel extraction when pit was created. One previous claimed record for this species from Denge Marsh in 1861 within the herbarium of John Stuart Mill. [examined by SL at Kew, and carries annotations casting doubt on ID; the material itself is currently not confirmable.]
Denge Marsh	TR0519, TR0619	SSSI	7 July 2019	SL	Dungeness SSSI (Unit 67), RSPB Reserve, north-west of Hamilton Farm area, pond, TR 0598 1911 and .TR 0606 1900. Colony along southern edge of pond mixed with *Eleocharis palustris* and intermediates between two, with lowest glumes circling one opposite, but both sterile.
Hacklinge	TR3354	SSSI	17 June 2018		Hacklinge, west side of A258, cattle grazed pasture and ditches (Unit 56), area north of the North Stream, TR 339 543 / TR 339 544 / TR 338 545. Found sporadically over pasture, with more common Eleocharis palustris and intermediates. Intermediates have

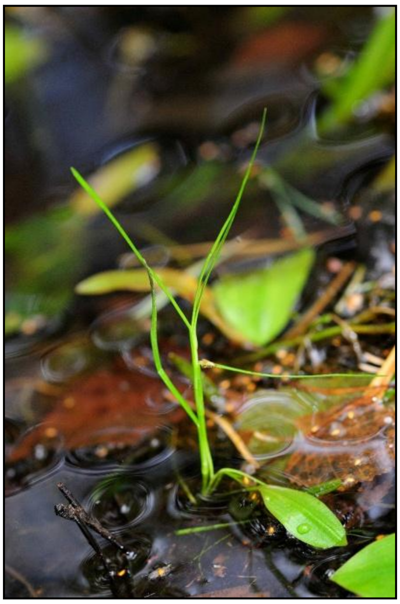
					lowest glume almost encircling base of spike combined with two lowest glumes empty/infertile.
Ham Fen / Hacklinge	TR3454	SSSI	(1) 12 August 2023 (2) 13 August 2016 (3) 24 July 1991	(1) KFC meeting (2) SL (3) FR	(1) RSPB Lydden Valley, compartment 45, c.TR 343 562. (2) Cattle grazed marshy sedge rich fen pasture in Ham valley, on west side of A258 south of Hacklinge Farm (Unit 56 within Hacklinge Marshes SSSI). Area south of the dividing dyke, TR 340 542 / TR 341 542 / TR 340 541 / TR 341 541. Widespread but not obvious due to heavy grazing. Notable in lush ungrazed growth that fringed edge of old cow pats. (3) Recorded as Ham Fen. This area's records go back to 1871.
Lydden Valley	TR35M		After 1970, before 1981	Philp (1982)	
Worth	TR3456	RSPB reserve	22 June 2021	SL, SB & CPe	RSPB Lydden Valley Reserve Compartment 45. At TR 34257 56224 at margin of a shallow pool in a peaty field, a scrape dug in 2019/20, and in a mixed population with *Eleocharis palustris* and made easier to spot by virtue of short surrounding vegetation recently grazed down by cattle.
Sandwich Bay estate	TR3557	SSSI	(1) 2 May 2022 (2) 28 June 2020	(1) KBRG meeting (2) SL & SB	(1) TR3557. (2) (a) In a mixed population with *Eleopcharis palustris* at TR 35632 57605. A winter-flooded meadow still damp and with *Carex disticha*, *Oenanthe fistulosa* and *Dactylorhiza praetermissa*. (b) TR 3563 5759. Meadow along north-east side of Guilford Road. Colony mixed with *Eleocharis palustris* in a depression next to the Old Haven stream, on east side of public footpath.
North of Cooper Street	TR36A		2 August 1987	RF&AH	Visits on 23 May 1987 and 2 August 1987 were recorded just as at TQ36A. RF's annotated maps, however, show presence along ditches at TR 3146 6056; and at TR 3008 6145 and TR 3029 6196 (both off Potts Farm Drove, but it may be that the latter ditch no longer exists). In an adjoining monad, TR2962, a ditch is also marked for the species at TR 2983 6222 [not seen, 22 July 2014, GK, a small marshy area at a field ditch junction may have been this location, but perhaps susceptible to herbicidal treatment of adjoining arable].

Eleogiton fluitans (L.) Link (Floating Club-rush)

c 16; apparently gone from vc 15

Rarity / scarcity status

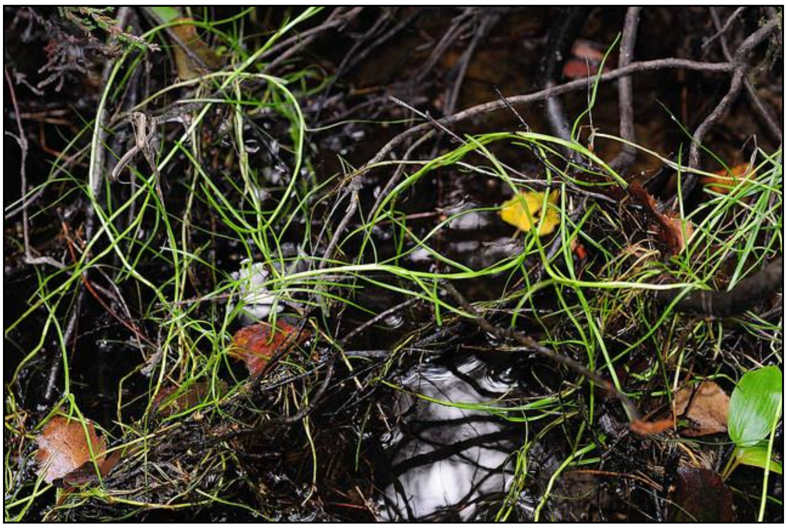
Floating Club-rush is not uncommon in the British Isles as a whole, and so is regarded as of 'Least Concern' in relation to risks to its survival, both as regards England and Great Britain, even though an assessment of presence in England including pre-1930 records would have shown significant decline. It has a primarily western distribution; its fewer eastern occurrences are related to the availability of peaty water. This is a restricted habitat in Kent, and as *Eleogiton fluitans* is now only to be found there in two stations, it is treated as **rare** in the county. It is a Kent axiophyte, indicative of good habitat.



Account

Eleogiton fluitans was first published for Kent by Colin Milne and Alexander Gordon in *Indigenous Botany* (1793) as seen 'in the river *Ravensbourne*, betwixt *Deptford* and *Lewisham*'. Hanbury & Marshall (1899) regarded it as local, to be found in streams, pools and ditches, especially on heaths. It had been seen by, or reported to, them from West Kent localities such as Keston Common, Stone Marshes and Tunbridge Wells; historic East Kent records appeared then to have been limited to a sighting near Brabourne, probably between 1829 and 1838. In the 1940s/50s it had also been known at Holwood Park lake, Rose Wood Ightham, Dry Hill Road Tonbridge (since developed), Pembury Woods, Warehorne (TQ 976 353), and Angley Wood.

Bedgebury. Photos by Lliam Rooney, 15 August 2014

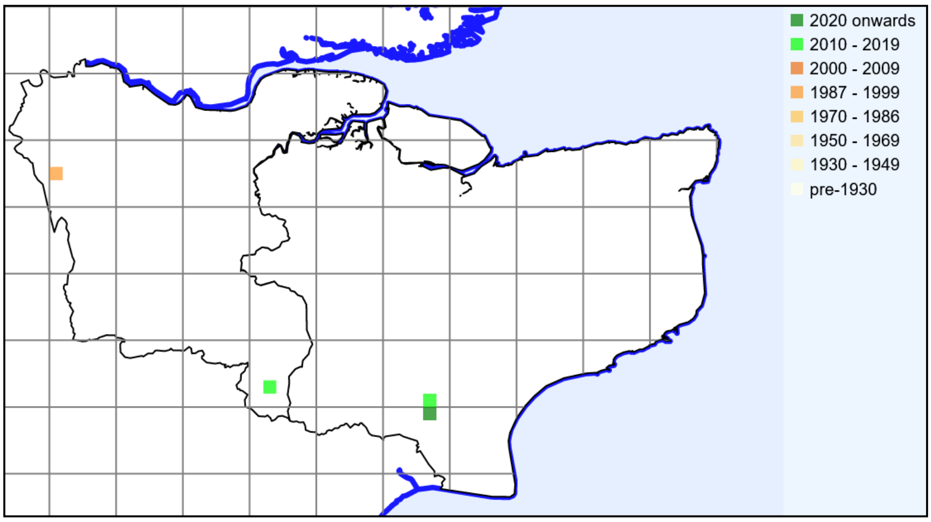


By the time of Philp (1982), records for the administrative county were down to two sites: Bedgebury Forest and Appledore. The species had also continued to be present at least until 1988 in a pond at Keston Common, in metropolitan West Kent, which was outside the scope of the 1971-1980 administrative county survey. Only the Bedgebury Forest site was recorded in the course of the 1991-2005 survey (Philp, 2010), where it grows in the nutrient-poor acidic waters of Louisa Lake. Our 2010-24 records have restored both sites, the Appledore presence being in a drainage ditch separating sheep grazed rushy pastures.

Eleogiton fluitans is very different from related British species, by virtue of being an aquatic with branched, narrow-leaved stems which float in the water. It may be found with other submerged aquatics, such as *Potamogeton* spp. (see Bedgebury photo below), but also in a more crowded context with general ditch vegetation (see Appledore photo below).

Bedgebury, habitat. Photo by Lliam Rooney, 15 August 2014

Appledore. Photo by Stephen Lemon, 7 July 2019


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Eleogiton fluitans **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Site	Grid reference	Site status	Last record date	Recorder	Comments
Keston Common (metropolitan vc16)	TQ4164		(1) 1988	(1) GH	(1) As TQ46C. (2) TQ 419 640, east side of pond.

			(2) 8 August 1987 (3) 21 September 1986	(2) RMB (3) JP	[Not seen on 18 June 2000 or since, RMB.] (3) Abundant in upper pond.
Bedgebury Forest	TQ7333	Access land	(1) 13 July 2019 (2) 26 July 2016 (3) 11 August 2012 (4) 4 August 1994 (5) After 1970, before 1981	(1) SSL (2) SB & OL (3) KBRG meeting (4) EGP (Philp, 2010) (5) Philp (1982)	(1) Bedgebury Forest, Stone Pool, north-eastern quarter, TQ 7351 3368. Flowering patch sprawling over water and *Potamogeton natans* at pond edge. (2) Still in the same woodland pool (Stone Pool) but the surface now much taken over by *Potamogeton natans*. Plants continuing in a vegetative state, still no flowers present. (3) TQ 73515 33694, covering about 3 square metres of mud and water at margin of woodland pool, non-flowering. (4) Louise Lake, Bedgebury Forest, TQ73G. (5) Abundant in small lake in Bedgebury Forest, TQ73G. Also present at Bedgebury in 2014 as indicated by photo captions.
Near Appledore	TQ9629 and TQ9630 (latter included in TQ93Q)	SSSI	(1) 22 July 2023 (2) 7 June 2019 (3) After 1970, before 1981	(1) & (2) SL (3) Philp (1982)	(1) TQ961299. Drainage ditch orientated north/south, separating sheep grazed rushy pastures. (2) Romney Marsh SSSI (Units 114 / 124), The Dowels, north-east of Appledore / immediately south of the Royal Military Canal, drainage ditch orientated north / south, separating sheep grazed rushy pastures, TQ 9613 3000 to TQ 9615 2991. Showing very well at the northern end in taller vegetation. (3) In fair quantity in a marsh dyke, given as TQ93Q.

Epilobium palustre L. (Marsh Willowherb)

vc 15 and 16

Rarity / scarcity status

Epilobium palustre is common in west acidic sites across the British Isles, and in 1978-99 it was recorded in 72% of 10km squares in Great Britain. Its English and Great British conservation status is one of 'Least Concern'. However, other than in parts of East Anglia, it is distinctly less common in south east England, and there have been losses, particularly since 1950. These have probably arisen from agricultural improvements, drainage and eutrophication. In Kent, there are relatively few recent records, and the species is **scarce**. . It is a Kent axiophyte, and so is indicative of good habitat.

Hothfield. Photo by Lliam Rooney, 9 September 2011

Account

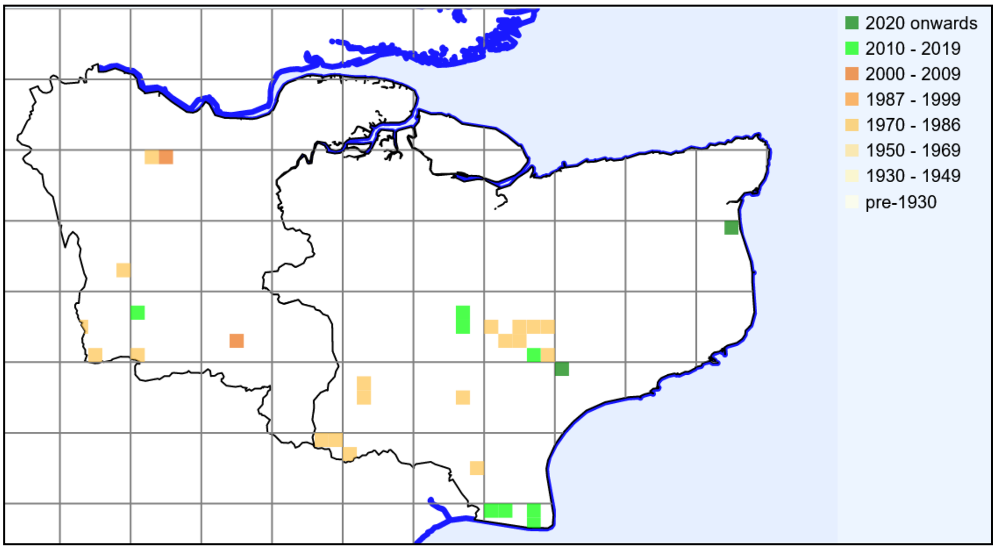
Marsh Willowherb was first recorded in Kent by Edward Jacob in his *Plantae Favershamienses* (1777), referring to it as "*In moist Places – common*". Hanbury & Marshall (1899) refer to it as local, in ditches and swamps, and give 16 locations for the species, in some of which it is said to be common or very common. The authors (although no doubt this is attributable to Marshall, who was particularly interested in willowherbs) say that "Doubtless, it is considerably more frequent than these few notes indicate. Our British willow-herbs have been much neglected, owing to the difficulty of separating their 'varieties', most of which are really hybrids". Uncertainties of identification – although this is not a particularly 'difficult' species – have probably continued to obscure population trends in the county. However, it is likely that the losses of good wet acid habitats in the county since Hanbury and Marshall's time have operated to reduce the frequency of this species.

Philp (1982) gave 29 tetrad records, mostly in the southern half of the county, with a concentration in TR04, around Ashford. Marsh Willowherb was then said to be rather local and scarce, in marshes and wet ditches. In Philp (2010) only four tetrad records are given: from Hothfield Common (two tetrads, this being a Hanbury and Marshall site), Hatch Park and Gibbin's Brook. This major reduction in records as between 1971-80 and 1991-2005 surveys could be interpreted as a population collapse. If it were attributable to habitat changes, one would expect to see parallel reductions in Kent populations of other species of bog and wet heathland habitats; but changes of this order are not apparent from the two surveys.

Lydd Ranges. Photo by Sue Buckingham, 7 August 2012

However, there is also the possibility that the ostensible change is an artefact of recording. The records in Philp (2010) were derived from Eric Philp's own observations; those in Philp (1982) were contributed by volunteer recorders, with varying degrees of expertise. It is possible that *Epilobium palustre* was at the time of the 1971-80 survey much scarcer in Kent than the survey results indicate. So, whereas the records of Hanbury & Marshall (1899) may, according to Marshall, have suffered from under-estimate, the records of Philp (1982) may have suffered from over-estimate. Ten tetrads (12 monads) have 2010-24 records, aligning better with the Philp (2010) results than those of Philp (1982).

***Epilobium palustre* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Epilobium palustre is in Kent found in bogs and in the vegetation of sandy or gravelly ground, generally acid and with a peaty / mossy overlay, around the margin of ponds or in damp hollows. It particularly favours areas which are subject to winter inundation and may grow with *Juncus* spp. and occasionally *Phragmites australis* (Common Reed). The plant spreads by wind-borne seed and by means of turions, small fleshy buds growing at the end of thread-like stolons, which are capable of regenerating in situ or becoming detached, and spreading with winter floods.

Recording errors may arise through the plasticity of many *Epilobium* species, and it should certainly not be assumed that a willowherb in a marsh is Marsh Willowherb. *Epilobium palustre* may also grow with *Epilobium obscurum* (Short-fruited Willowherb), but the Marsh Willowherb is distinguishable by its very narrow leaves, inrolling beneath at the margins, and by its long, narrow seeds, which exceed 1.3mm in length, and may be 2 mm. The thread-like stolons, with their turions, are also characteristic, but sampling may be destructive.

Hothfield. Photo by Lliam Rooney, 9 September 2011

Hybrids with *Epilobium hirsutum* (Great Willowherb) and *E. obscurum* have been recorded at Dungeness, the former in 1913 and the latter by Marshall in 1891, where he found it to be frequent, with the parents. Such hybrids are now limited by the scarcity of *Epilobium palustre* itself, but the cross with *E. obscurum* was recorded again in 2012, on MoD land at Lydd Ranges, within vc15 East Kent, but on the East Sussex side of the administrative county border.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Chiddingstone Causeway	TQ5146, TQ5147		(1) 17 June 2023 (2) 24 August 2013 (3) 27 June 1982	(1) KBRG / KFC meeting (2) SL (3) KFC meeting	(1) TQ 51064 47123, wet peaty ground of fomer brickworks, towards margin, growing with *Cirsium palustre, Epilobium ciliatum, Galium palustre, Lotus*

					pedunculus, Juncus effusus, Juncus inflexus. (2) In good numbers in winter flooded grassland and around the edges of ponds in two separate areas on Chiddingstone reserve. Noted at TQ 51128 46983, TQ 51097 46992, TQ 51055 47083 and TQ 51057 47077. Grows amidst *Juncus* spp. and also *Salix* re-growth, sometimes with other *Epilobium* species nearby. (3) Grid reference not given.
Hothfield Common	TQ94S, includes TQ9645	SSSI & KWT managed reserve	(1) 17 September 2018 (2) 8 August 2015 (3) 15 August 2013 (4) 9 September 2011 (5) After 1990, before 2006	(1) AW (2) BW (3) CO (4) SB (5) EGP (Philp, 2010)	1) TQ9645 (2) TQ9645. (3) TQ9645. Two plants in full flower c.4 metres west of northern end of board-walk over main bog. (4) Several plants in bog at TQ 96945 45685. (5) TQ94S.
Hothfield Common	TQ94T, includes TQ9646	SSSI & KWT managed reserve	(1) 21 June 2020 (2) 11 July 2019 (3) 9 September 2011 (4) After 1990, before 2006	(1) AL (1) AL (3) SB (4) EGP (Philp, 2010)	(1) TQ 9674 4612, grazed *Carex paniculata* swamp. (2) TQ 9673 4612, Half-height tussock sedge swamp in Bog 4. (3) A few scattered plants in sphagnum bog at TQ 96755 46114. (4) Recorded as TQ94T. Recorded at least back to 1944.
Lydd Ranges	TR0118	MoD land	7 August 2012	OL, GK, SB & TI	Scattered at TR 01436 18750 with *Juncus effusus*. In East Sussex administrative county (but vc15).
Lydd Ranges	TR0319	MoD land	7 August 2012	OL, GK, SB & TI	On west, north and east sides of pond on acid ground, with fluctuating water levels. Small quantities on margins, shady areas close to surrounding *Salix* (at TR 0353 1939, TR 0351 1938 and TR 0356 1936). Large quantities at western end in wet moss below *Phragmites*, e.g. at TR 0348 1937.
Hatch Park	TR04Q	SSSI	(1) 29 August 2013 (2) 1 August 2012 (3) After 1990, before 2006	(1) & (2) GK (3) EGP (Philp, 2010)	(1) One plant by Heron Pond, TR0640. (2) Occasional in marshy acid ground in rushes on north west side of Heron Pond, Hatch Park, TR 0663 4064, with *E. obscurum*. (3) Recorded as TR04Q.
Dungeness	TR0618, TR0717, TR0718	RSPB reserve	(1) 4 June 2018 (2) 2012	(1) AW (2) BB	(1) TR0718 (2) Present in pits 4 (TR0717), 8 (TR0718) & 6 (TR0618); in the latter, frequent in peaty area following *Salix* clearance. Was present in pit 4 in 2002, as also pit 5 (TR0618), from which it appears to have gone.
Gibbin's Brook	TR1138	CROW access land, SSSI	(1) 28 June 2023 (2) 30 June 2013 (3) After 1990, before 2006	(1) & (2) KBRG meeting (3) EGP (Philp, 2010)	(1) Frequent in southern mire (2) Widespread in northern bog, less so in southern bog other than in wetter areas amidst *Juncus* spp. (3) Recorded as TR13E.
Sandwich Bay	TR3555		23 June 2001	FR	In dune slacks.
Sandwich Bay	TR35559		19 October 2023	SB	Grassland within proposed Princes golf course project, recorded 12 July 2023

Epipactis palustris (L.) Crantz (Marsh Helleborine)

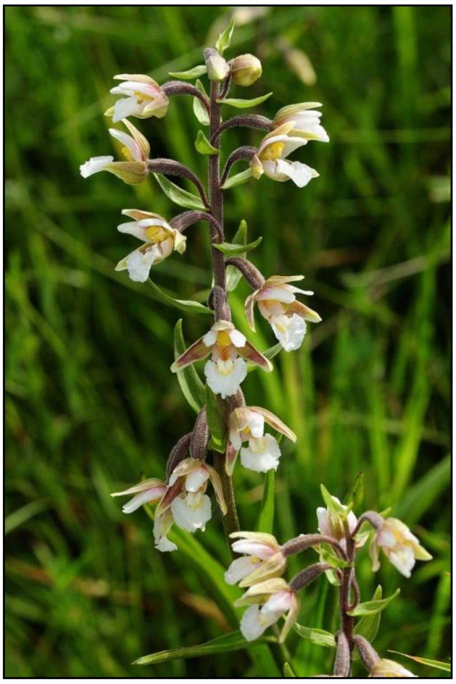
vc 15; probably gone from vc 16

Rarity / scarcity status

The Marsh Helleborine enjoys a widespread but patchy distribution in England, Wales and Ireland, but with only minor presence in Scotland. In Great Britain its risk status for conservation purposes is regarded as being of 'Least Concern', but in England it is treated as **Near Threatened**. In Kent it is very local and **scarce**. It is classified as a Kent axiophyte, indicative of good habitat.

Account

The first published county record – indeed, the first British record - for *Epipactis palustris* appears in the *Stirpium Illustrationes* of Matthias de L'Obel, edited by William How and published in 1655, well after L'Obel's death. The book describes it as a plant with a stem a span tall (seven inches) and with a spurred flower becoming purplish from white, found in 1601, in the water meadows of the village called Mary-cray.



Sandwich. Photo by Lliam Rooney, 9 July 2010

Charles Darwin wrote at length as regards the flower structure and fertilisation of *Epipactis palustris*[189] and sought help from G.C. Oxenden of Broome Park, Barham, where the plant grew, as noted by Hanbury & Marshall (1899). A letter from Oxenden dated 8 July 1862[190] describes his endeavours:

> "I do assure you, you expressed a desire to know if Insects visited "Epipactis palustris" at Night— We have not seen even One instance of any such Visits—but I feel sure that they are thus visited—& that their absence on the nights in question was due to the very disturbed state of the atmosphere—
> —As regards the access of Insects in the day time— I have spent two whole days in a Marsh Containing these plants in flower, without detecting so much as one insect upon them—But then, the days were each damp & lowering—
> —In this splendid Marsh, I yesterday found four Mowers hard at work— —I tried to save the flower crop by a very large Money Offer—but the Farmer assured me he really needed the rough rush & reed for thatching purposes—".

Hanbury & Marshall (1899) assessed the species as local, found in boggy places, usually among bushes or long herbage, and gave a scattering of records from L'Obel onwards across the county. By the time of Philp (1982) and Philp (2010), records had reduced to two areas: a chalk pit at Swanscombe and scattered colonies on fixed sand dunes over three tetrads in the Sandwich Bay area. Both these areas are representative of habitat types for this species, but the species now survives only at Sandwich.

The Swanscombe site (Bamber Pit) held 200 plants in 1976, including a yellowish-white flowered form (forma or var. *ochroleuca*), when seen by John Palmer[191], and the population had become over 1000 in several patches on the pit floor by 1982, according to David Johnson. Even then, the habitat was beginning to dry out with partial infilling of the pit, which continued into the early 1990s, and the Marsh Helleborine did not long survive these changes; it could not be found in 1994. It is not the only West Kent record related to chalk pit floors which may be subject to periodic inundation. James Sherard recorded it as very common in old chalk pits between Eltham and North Cray, as mentioned in the third edition of John Ray's *Methodica Stirpium Britannicarum* (1724). There are also records relating to chalk pits at Greenhithe and near Empire Paper Mills (probably both TQ57X) in the 1940s and 1950s. The latter site may be responsible for literature references[192] to a dwarf form, possibly affected by drying out. Appearances in drier chalk habitats have been suggested to be residual from what were originally damper conditions, or to reflect seasonal dampness.

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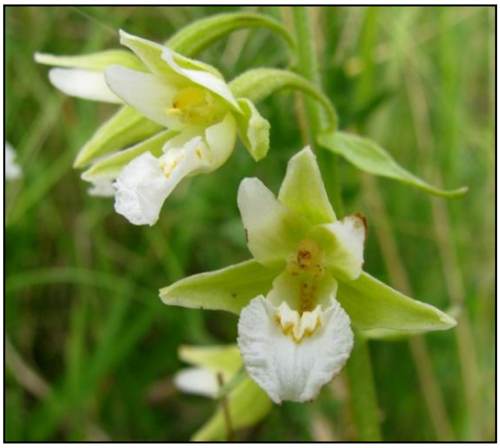
[189] Darwin, C.R. (1877). *The various contrivances by which orchids are fertilised by insects*, 2nd edition. John Murray, London.

[190] Darwin correspondence project. https://www.darwinproject.ac.uk/letter/?docId=letters/DCP-LETT-3647.xml

[191] *BSBI News* (September 1993) 64: 17. This appears to be the only recorded Kent sighting of this form other than a couple of plants seen at Sandwich Bay by David Johnson in 1992.

Sandwich. Photo bySue Buckingham, 6 July 2019

The fixed dunes of Sandwich Bay, with lime content from their shelly sand, provide another calcareous substrate, and the slacks are also subject to periodic inundation, providing an environment analogous to chalk pit floors, despite being so different in appearance. Records here go at least as far back as 1839 when M.J. Cowell (in *A Floral Guide for East Kent, etc*.) published plants lists, including this species for the marshes near the sand downs between Deal and Sandwich noted by the Revd. M.J. Berkeley. Marshall also found *Epipactis palustris* to be locally abundant near Sandwich, so there is a history of continuity for what is now its only Kent station. It has also been known north of Sandwich, at Stonelees, where there was a colony of over 1000 spikes in the mid-1950s amongst grass and sparse *Phragmites australis* (Common Reed), seemingly a habitat which was drier than would normally be expected. This population apparently rapidly declined afterwards, perhaps related to a cessation of grazing.[193] Colonies may expand, as well as contract: what was described as a 'small colony' in 2011 on Sandwich Bay Bird Observatory land had grown to 1,672 flowering spikes in 2019.



Sandwich. *E. palustris* var.*albiflora*. Photo by Daphne Mills, July 2010

Inland, south of Sandwich has also provided a habitat where the Marsh Helleborine may yet be re-found. Lewis Dillwyn provided to the Linnean Society in 1801 a catalogue of plants which included this species as present in boggy ground about Ham Ponds, marshes about Hacklinge between Deal and Sandwich, and in Wingham Marshes. Its presence about Ham Ponds was also known to Hanbury & Marshall (1899), and Marsh Helleborine was seen here by at least one of the authors. It was known here to Francis Rose from 1946, growing with *Cladium mariscus* (Great Fen-sedge) and *Juncus subnodulosus* (Blunt-flowered Rush) and was still present in July 1991, when seen by him. The peaty fen of Ham Ponds has a calcareous content related to historic changes in the direction and outlets of the River Stour, and the taking of drainage from the chalk. This different habitat accordingly has features in common with the chalk and dune habitats.

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[192] E.g., V.S. Summerhayes (1952), *Wild Orchids of Britain*.

[193] Dennis Harle (1977), in *Sandwich Bay Observatory Report*, comm. D. Johnson.

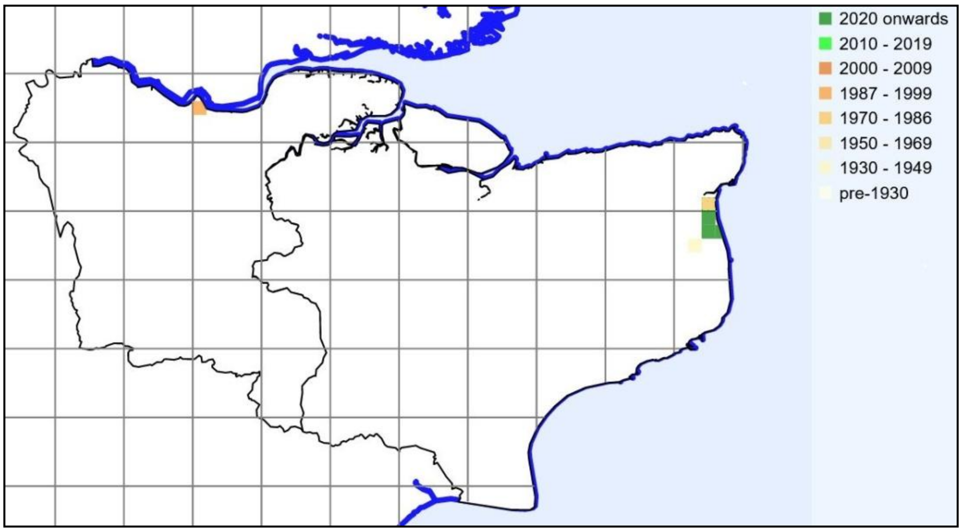
Epipactis palustris is a distinctive orchid, not readily confused with any of the other British species, particularly because of the generally whitish flowers ambiguously streaked or suffused with brown, green or reddish coloration, and with a frilly lip. Pure white flowers have been recorded at Sandwich – forma or var. *albiflora*, which lacks even the purple veining of the interior of the hypochile which would normally be found in white variants (forma or var. *ochroleuca*).

The plant may form a patch of spikes or rosettes from shoots arising at the ends of branching rhizomes creeping horizontally just below ground surface; vegetative spread appears more important than spread by seed. The shallow rhizomes place the plant at risk of permanent changes in water table levels[194]. Seasonal inundation probably operates to diminish competition from other vegetation. Preference for open, unshaded wet conditions means that it may be at risk in mature sand dunes which become overgrown, and it was noted in 2021 how quickly a colony recovered at Sandwich following winter clearance of bramble and scrub which had overrun a dune hollow.

Sandwich. Photo by Lliam Rooney, 9 July 2010

While predicted climate change may initially favour the species in the British Isles, under severe climate change suitability may be lost in the south and/or east, which is likely to be prejudicial to Kent.[195]

We have recorded as associated species *Dactylorhiza praetermissa* (Southern Marsh-orchid), *Hydrocotyle vulgaris* (Marsh Pennywort) and *Salix repens* (Creeping Willow), all of which share the habitat preferences of *Epipactis palustris.*



***Epipactis palustris* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Site	Grid reference	Site status	Last record date	Recorder	Comments
Swanscombe	TQ6074	SSSI from	(1) After 1990,	(1) EGP	(1) Chalk pit, recorded as TQ67C.

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[194] Jacquemyn, H. & Hutchings, M.J. (2014). Biological Flora of the British Isles: *Epipactis palustris. Journal of Ecology 102: 1341-1355.*

[195] Berry. P.M., Dawson, T.P., Harrison, P.A., Pearson, R. & Butt, N. (2003). The sensitivity and vulnerability of terrestrial habitats and species in Britain and Ireland to climate change. *Journal for Nature Conservation* **11**: 15–23.

		2021	before 2006 (2) 19 July 1986 (3) 1982 (4) 10 July 1976	(Philp, 2010) (2) GK (3) DJ (4) JRP	(2) TQ 607 746, chalk pit floor. (3) Over 1000 plants, plants growing in several patches with very robust *Dactylorhiza fuchsii*, *Neottia. ovata* and *Pyrola rotundifolia*. (4) Over 200 plants, including var.*ochroleuca*. Also present: *Dactylorhiza praetermissa*, *Anacamptis pyramidalis*, *Pyrola rotundifolia.*
Ham Fen	TR3454		24 July 1991	FR	
Sandwich / Pegwell Bay	TR3463	SSSI, local nature reserve	23 June 1997	JS	TR 341 632.
Sandwich Bay area	TQ3560	SSSI	4 August 1996	FR	TR3560. Locally frequent in slacks by pool.
Sandwich Bay area	TR35N, includes TR3557	SSSI	(1) 23 May 2022 (2) 19 June 2020 (3) 6 July 2019 (4) 1 August 2011 (5) 22 June 2002	(1) KBRG meeting (2), (3) &(4) SB (5) EGP (Philp, 2010)	(1) Leaves only, in SBBOT's Whitehouse Field. (2) Thriving colony on Bird Observatory land at TR 3587 5753, now spreading with new small satellite colonies growing at TR 3590 5754 and at TR 3579 5751. (3) Colony on bird observatory land at TR 35803 57536 and described as small colony in 2011 has grown to have 1,672 flowering spikes (counted by warden) (4) Small colony in damp dune grassland at TR 35803 57536 (5) Fixed sand dunes, TQ35N.
Sandwich Bay area	TR35P, includes TR3559	SSSI	(1) 15 May 2024 (2) 12 July 2023 (3) 27 July 2022 (4) 6 July 2019 (5) 16 July 2013 (6) 17 July 2010 (7) 9July 2010 (8) 24 June 2010 (9) After 1990, before 2006 (109) 4 August 1996	(1) AL, AWr & TH (2), (3) & (4) SB (5) CO (6) DM, FB & JS (7) JA (8) SB (9) EGP (Philp, 2010) (10) FR	(1) TR 3565 5921. (2) (a) Royal St Georges golf course. A colony of 17 flowering in a damp area (foot of large dune) at TR 35522 59120. (b) 120 flowering/fruiting at TR 3565 5924 almost opposite Princes Hotel (same location where 33 were recorded in 2020). (3) TR 3550 5956, some 400 to 500 fruiting plants in usual roadside dune slack alongside road on Prince's golf course. (4) a) 570 flowering spikes in dune hollow at TR 3550 5956, west side of the road leading to Prince's golf clubhouse. (b) 33 flowering spikes alongside Prince's 'old practice range' from TR 35212 59192 to TR 35177 59243. Also a small colony of ten beside a newly created wetland, close by, at TR 35132 59140. (c) 48 flowering spikes in old dune slack by public footpath between golf courses at TR 3538 5916. (5) At least 75 flowering spikes in damp hollow by willows adjoining ditch just past barrier gate across track, (+1) c TR 355 592. (6) Var. *albiflora* Luscher found at TR3559 in a damp, Salix-bordered depression in part of the golf course, beside a public footpath and a small drainage channel. (Two flowering spikes also seen in TR3559 by AB, 11 July 2012.) (7) 30 spikes at TR 35383 59158, 30 at 35386 59164, 14 at TR 35302 59140. (8) TR 35385 59158, large colony in

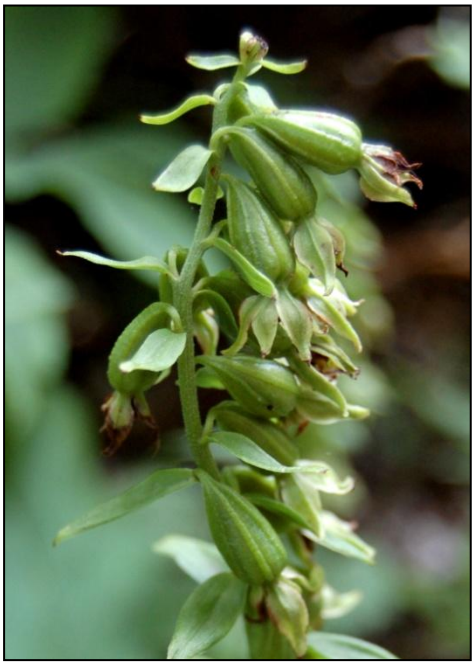
					dune slack by public footpath, possible threat from trampling. (9) Fixed sand dunes, TQ35P.. (10) TR3559. Locally abundant in dune slack.
Sandwich Bay area	TR35T, includes TR3657	SSSI	(1) 2 July 2021 (2) 19 June 2020 (3) 1 August 2011 (4) 27 June 2010 (5) After 1990, before 2006	(1) SB (2) & (3) SB (4) SC (5) EGP (Philp, 2010)	(1) At least 30 flowering or in bud in a dune hollow which had previously been badly overgrown with bramble and scrub. Cleared last winter and now with a good population of these and Southern Marsh Orchids. TR 36074 57433. (2) Several hundred flowering spikes at TR 3629 5727, in an old wet dune slack with *Salix repens*, *Hydrocotyle vulgaris* and *Dactylorhiza praetermissa*. The habitat is kept open by volunteers from Sandwich Bay Bird Observatory. (3) 12 plants in dune slack at TR 36300 57265. (4) TR 362 573. (5) Fixed sand dunes.

Epipactis phyllanthes G.E. Sm. (Green-flowered Helleborine)

vc 16; gone from vc 15

Rarity / scarcity status

The Green-flowered Helleborine has a scattered distribution in England and Wales, and few locations in Ireland. Its overall distribution is not static, as it has been found that populations tend not to be long-lived, but a general decline in southern England had been observed, partly compensated by new populations in the north, although its current national strength is such that it is no longer regarded as nationally scarce. The threat level to this species in Great Britain and in England is one of 'Least Concern'. In Kent, it is **scarce.**



Foots Cray Meadows. Photo by Ann Clarke, 9 August 2008

Account

The first Kent record appears to have been at Rubery Down (otherwise Three Burrows Down), Womenswold in East Kent (TR 247 497), a colony which Donald Young[196] described as being still extant around 1952 with less than 10 plants, having been seen irregularly since 1926 in a small beech copse on chalk with thick ivy ground cover. It was written up by Brooke and Rose[197] as being covered by a new nomenclatural combination of *Epipactis vectensis*, a name which is not now used, but which was broader in concept than the variety known as var. *vectensis*. Young considered that the Womenswold plants were var. *degenera*, a variety from southern England in which the lip of the flower is degenerate in the sense that it is not, or is imperfectly, differentiated into two parts (the differentiation of the lip into hypochile and epichile being a normal character of the genus *Epipactis*). No records from this site are known since the 1950s.

Lullingstone, roadside habitat, in beech litter. Photo by Lliam Rooney, 16 August 2013

Green-flowered Helleborine was first found in West Kent at Lullingstone in 1956, communicated by Mrs Denton to Donald Young for confirmation. It was described by Francis Rose as being abundant in a beech belt by the railway. The population was damaged as a result of the realignment of the A225 few yards away in early 1973, which created a chalk embankment cutting into the edge of the plantation and let in the light. It was feared lost after this (*Flora of the London Area*, 1983), but it was seen in 1975 and its survival was monitored by David Johnson[198] from 1979. More recently, regular counts have also been made by KWT. Numbers have risen from 20-30 each year to over 100 in 2007 and 2011. The road embankment has scrubbed up so as to restore shade, and the helleborine has spread from the wooded top of the bank where a path runs, to the road-verge at the shaded foot of the embankment, close to the carriageway. Those plants at the top of the bank, under the shade of mature tree cover, tend to be larger, 20-35cm tall with up to 15 florets. The roadside plants (see illustration) tend to be small and weedy, seldom more than 20cm high with 5-10 florets.

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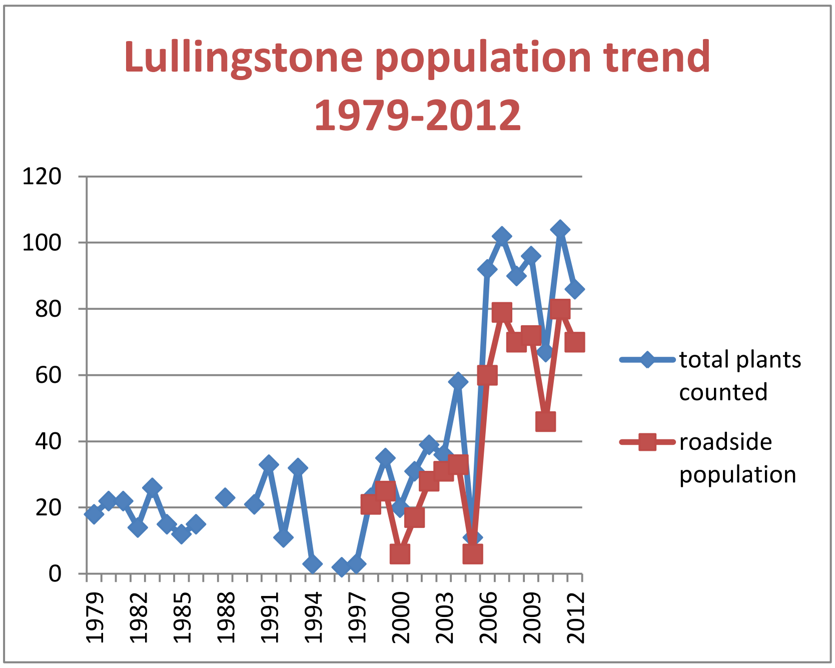
[196] D.P. Young. Studies in the British Epipactis. Part IV. A revision of the phyllanthes-vectensis-pendula group. *Watsonia* (1952) 2:259-276.

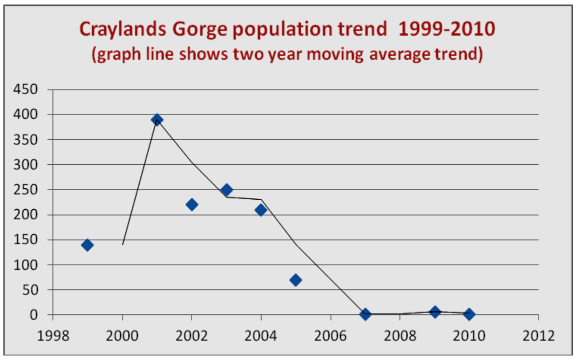
[197] B.J. Brooke & F. Rose. A new species of British Epipactis. *Journal of Botany* (1940) 78: 81-89.

[198] An interesting discussion generally as regards north west Kent occurrences, from which some of the following observations are taken, is provided by David Johnson in More notes on Kentish Orchids: Green-flowered helleborine (*Epipactis phyllanthes*), *The Newsletter of the Kent Field Club* (February 2008) 67: 4-6. He has also kindly assisted with comments on an early draft of this account.



In effect the roadside plants have comprised an extension of the original embankment colony which has become more prolific than the original. The accompanying chart shows how the roadside plants regularly out-number the others. Their appearance on the chart in 1998 reflects when they were first observed in the course of monitoring. They may well have been present before then, although it is a relatively new habitat, created by roadworks. The 'crash' in numbers for 2006 was at least in part the impact of highway strimming. An odd plant was found in 2017 some 890m south of the colony. Highway strimming again assailed the roadside population in 2018, reducing a count of over 120 plants on 12 July to seven or eight very small specimens later that month.

There have been other shaded chalk sites of north west Kent in which this species has been discovered – some pits in the Stone / Greenhithe /Swanscombe area are mentioned in the table below. These have in the past sometimes harboured significant numbers of plants. David Johnson has pointed out that the Craylands Gorge population probably held the largest British population in the early 21st century. This is a deep shaded chalk cutting, excavated to serve as a mineral railway connecting chalk pits, but long disused in relation to its original purpose. *Epipactis phyllanthes* seems to have been first found here by John Palmer in 1979 and the maximum numbers recorded were 390 in 2001. Since then, the population fell away (see chart) without any obvious explanation – there do not seem to have been any marked habitat changes. This may be no more than the recognised tendency of the plant to come and go. A.J. Richards[199] has stated that site occupancy seems rarely to exceed 30 years. He also mentions that the species is frequently associated with *Pyrola minor* (Common Wintergreen); however, at Craylands Gorge its association was with *Pyrola rotundifolia* (Round-leaved Wintergreen), also a plant of damp, shaded calcareous habitats, and *Hedera helix* (Common Ivy).



The prospects for records of continued and new occurrences of this species on the north west Kent chalk are diminished by the decline of the Craylands Gorge population (and by 2021 its total or near-destruction by being buried) and by the position regarding old chalk pit habitats. Kent was historically of international importance for cement production, and much chalk was excavated for this purpose, especially in the area from Dartford to Northfleet. The habitats which the former chalk workings have supplied for *Epipactis phyllanthes* are disappearing with development, and the increasing installation of palisade security fencing has reduced accessibility to those which remain.

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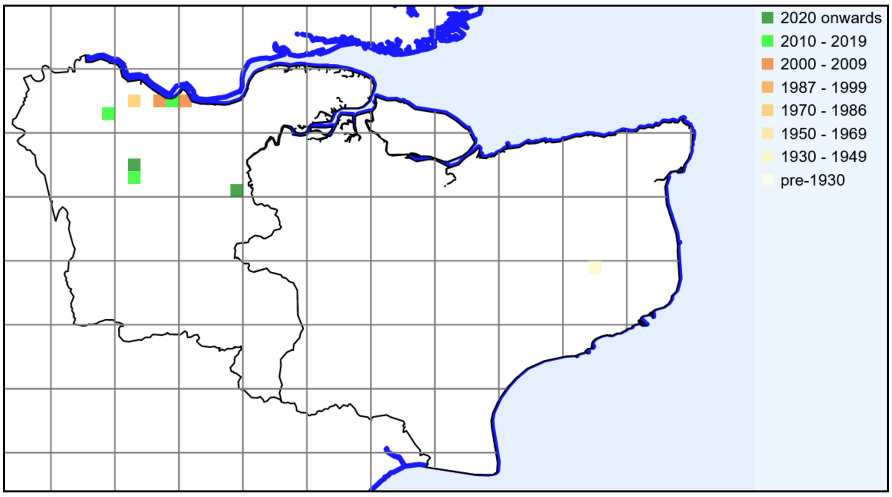
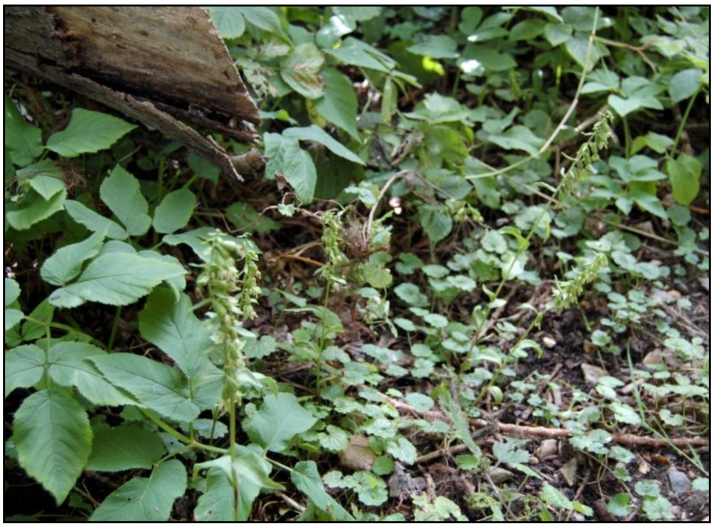
[199] A.J.Richards, *Epipactis phyllanthes* G.E.Sm., in (eds.) A. Stewart, D.A. Pearman & C.D. Preston, *Scarce Plants in Britain* (1994), JNCC.



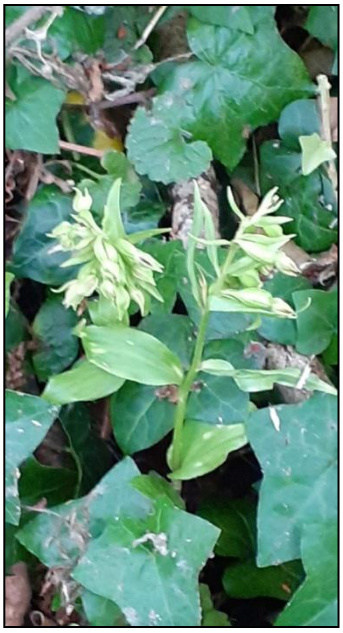
***Epipactis phyllanthes* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Within the British Isles as a whole, *Epipactis phyllanthes* is known to grow in a wider range of habitats, often on sandy soil, including dunes. Such occurrences are not yet recorded in Kent, but another habitat-type which does have Kent records is riverside terrain subject to occasional flooding and sometimes with *Salix* spp. present. One such population existed by the River Darent in the grounds of Lullingstone Castle, mainly under *Aesculus hippocastanum* (Horse-chestnut), but also amongst the roots of *Alnus glutinosa* (Alder), down to water level. This colony usually consisted of 30 to 40 flowering plants, with a maximum of about 60. It was extinguished by the trees being blown down in the great Storm of 1987. Although not far from the Lullingstone A225 site on chalk, it was a distinct site, in a distinct habitat.



Foots Cray Meadows. Photo by Ann Clarke, 9 August 2008

An analogous population was discovered in August 2008 by Ann Clarke at Foots Cray Meadows. There were then 14 plants on flat ground near the River Cray under *Salix x fragilis* (Crack-willow) with very ordinary vegetation of shaded disturbed ground: *Aegopodium podagraria* (Ground-elder), *Glechoma hederacea* (Ground-ivy) and *Urtica dioica* (Common Nettle). A further find in a similar habitat by water was made by Danny Chesterman in 2021, at Leybourne, again near *Salix x fragilis* and the other associated flora of Foots Cray Meadows, plus *Geum urbanum* (Wood Avens), *Corylus avellana* (Hazel) and *Alnus glutinosa* (Alder).



Leybourne. Photo by Michael Easterbrook, 24 July 2023

Green-flowered Helleborine is a fairly inconspicuous green plant, distinguishable from other similar helleborines by its infloresecence-axis being glabrous and the flowers drooping as soon as they open. The flowers may not open properly at all, and the species is self-pollinating, which can result in local variability. Currently, five variants are known in the British Isles, although intermediates exist between these. In Kent, var. *degenera* has been identified at Womenswold, Leybourne and Lullingstone; and var. *phyllanthes* at Foots Cray.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Foots Cray Meadows (metropolitan vc16)	TQ4872	London Borough of Bexley public open space	5 August 2008	ACla	TQ 4836 7204, 14 plants at pathside near river under *Salix x fragilis.*
Lullingstone, riverside	TQ5364		Before October 1987	TH-D, comm. DJ	TQ 532 643, in Lullingstone Castle grounds, destroyed by Great Storm of October 1987. See account in text above.
Lullingstone, A225	TQ5263	RNR	29 June 2016	GT & KWT volunteers	TQ 52965 63482, on wide, open section of road verge, c.890m distant from long-established colony. Noticed because close to a quadrat survey unrelated to this species.
Lullingstone, A225	TQ5364	Part of site is RNR	See text and comments		Many records from 1956 onwards, in area of TQ 533 642 to TQ 534 655. More recent counts are 102 (2007, DJ); 90 (2008, DJ;, 96 (2009, DJ); 67 (2010, DJ - a KWT count of 79 was also made); 104 (2011, DJ -the equivalent KWT count was 82); 86 (2012, DJ); .70 (2013, DJ), 81 on roadside, 4 in plantation (2014, DJ); 54 on roadside, 11 in plantation (2015, DJ); 118 (KWT, 2016); 163 (KWT).
Stone	TQ5774 (TQ57S)		(1) July 2001 (2) 23 July 2001	(1) DJ (2) EGP & PHe	(1) A single plant flowering on the edge of a tarmac path close to a new housing estate built a couple of years previously close to Stone Churchyard. (2) May be the same plant, recorded as in TQ57S. Tetrad TQ57S has a history of records. Philp (1982) refers to a small colony in a chalk quarry. This appears to refer to a pit at TQ 578 748 near Stone Churchyard. DJ recorded between 20 and 30 plants flowering there under scrub in the late 1970s and early 1980s. The last record was 14 flowering in 1986; by 1988 the area had completely scrubbed over and has since been developed. A larger colony at another pit in this tetrad, the Atlas Stone Company pit at Stone, was destroyed (Philp, 1982).
Craylands Gorge	TQ5974		(1) 21 July 2018 (2) 13 July 2010	(1) reported to DJ (2) DJ	(1) TQ 5988 7479, Craylands Gorge, 19 plants of which 2 dried up and 1 broken off, all singletons, the tallest 30cm with 8 florets (2) TQ 5988 7479, only one plant found growing in dense ivy. No apparent changes in the part of the Gorge where the plant grows. Numbers have grown and declined: one spike (1979, JRP), 27 (13 July 1982, JRP), 140 (1999, DJ), 390 (2001, DJ), 220 (2002, DJ), 250 (2003, DJ), 210 (2004, DJ), 70 (2005, DJ), 2 (2007, DJ), 6 (2009, DJ), 1 (2010, DJ). The record for TQ57X in Philp (2010) – seen 23 July 1999 by EGP and PHe – refers to this location.
Swanscombe	TQ67C		14 July 2000	EGP & PHe	Found earlier by PHe and RBr, in

					chalk pit, when there were three plant below *Salix* surrounded by *Buddleja* (c. TQ 612 746, per DJ and subsequently affected by high speed 1 rail link). [This grid reference is a little too far north east, as its site had already been taken over by HSL in 1999.]
Leybourne	TQ6960		(1) 22 July 2024 (2) 24 July 2023 (3) 22 August 2021 (4) 14 August 2021 (5) 10 August 2021	(1) & (2) DCh & ME (3) DM (4) GK (5) DC	(1) TQ 697 602 [sic], at site where two plants seen in 2023, but now one only, c.2ft away. (2) TQ 69643 60142 (gridref taken 28 July 2023), alongside a path that goes off Old Lunsford Lane at TQ 697 599, thence leading into TQ6960. The path goes alongside a garden fence, then through a metal gate, then continues between two lakes. Thehelleborines were about 100 yards past the gate, on the right hand side of the path going north, in a narrow belt of scrub between path and lake, with ivy and other plants in the ground vegetation. (3) In addition to the plant previously seen, a second plant was recorded at TQ 69629 60165, twelve paces away. (4) TQ 69644 60141, one plant with two stems, one blind, one in flower, var. *degenera*. Very close to footpath between two lakes, so fairly low-lying and in proximity of willows. Associated spp included *Glechoma hederacea, Geum urbanum, Urtica dioca, Coryllus avellana, Alnus glutinosa, Salix x fragilis* sensu lato. (5) TQ 6965 6013, one plant in flower on public footpath.

Equisetum sylvaticum L. (Wood Horsetail)

vc 15 and 16

Rarity / scarcity status

Wood Horsetail is widespread in suitable habitats in western Britain from Wales northwards, in northern England and Ireland, and throughout Scotland. It is not regarded generally as at risk and its English and Great British conservation status is one of 'Least Concern'. In southern lowlands, it appears to be in long term decline and in Kent it is **scarce**.

Hunstead Wood near Chartham Hatch. Photo by Lliam Rooney, 9 May 2011

Account

The first published notice of Wood Horsetail in Kent is by Christopher Merrett, in his *Pinax rerum naturalium Britannicarum* (1666), where he listed the species as "In *Charlton* woods". Hanbury & Marshall (1899) were able to give only a few records and regarded it as rare in Kent, to be found in damp copses. Francis Rose referred to as in 'acidic flushes or on spring-lines in woodlands, especially in Alder carrs, on weakly acid, very wet, sandy or peaty soils where there is some horizontal movement of water' (manuscript *Flora of Kent*); most of his records were in the Tunbridge Wells area, although he noted the last vc15 record, at Sandpits Wood, Biddenden in 1963.

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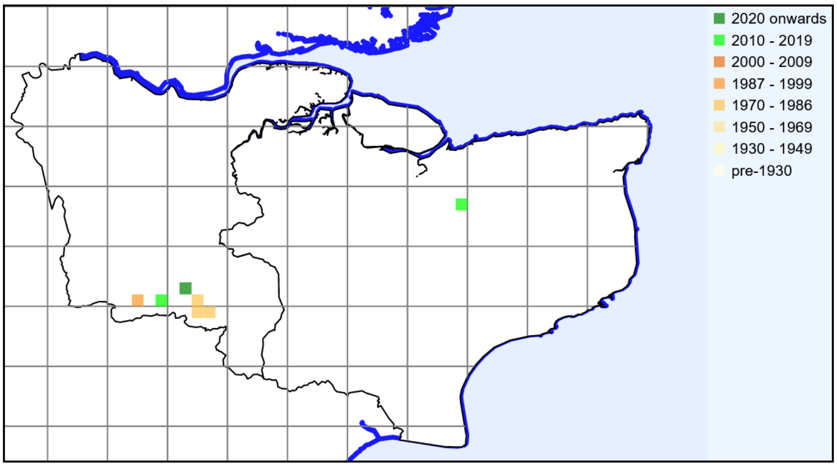
Philp (1982) recorded it in six tetrads: one near Chartham Hatch and the remainder near Tunbridge Wells. In Philp (2010) these were reduced to the Chartham Hatch population and only three tetrads near Tunbridge Wells (albeit that one of these was a different tetrad, where seen by Joyce Pitt in 1986). This diminution may represent part of the general decline in the lowlands of southern Britain, or it may be that further search would restore the missing populations. However, it is likely that the species is moving from scarcity towards rarity in Kent. Our 2010-22 records also amount to three tetrads (and monads).



***Equisetum sylvaticum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The current areas of presence represent long term locations. Chartham Hatch was a location contributed to Hanbury & Marshall's *Flora* (1899) by the Right Revd. John Mitchinson (formerly Bishop of Barbados and subsequently Master of Pembroke College, Oxford). Tunbridge Wells area records were known at least as far back as 1805, when Dawson Turner and Lewis Dillwyn state that Mr J. Woods junior reported it from "Woods North East of Tunbridge Wells".

Equisetum sylvaticum grows mainly on acidic, humus-rich soils, particularly where groundwater seeps through. Most of the Kent occurrences appear related to soils over the acidic Tunbridge Wells Sands or the junction of that formation with Wadhurst Clay, although the Chartham Hatch location is on Thanet Sand. Whilst Wood Horsetail is named for its growth in shady conditions, observations at the latter site, and at Pembury, where it is exposed to light at a roadside, suggest that water movement may be more important than shade. It is a species readily distinguished by the drooping branches of its shoots, whose delicate appearance arises from their slenderness and repeated branching.

Pembury. Habitat photo by Sue Buckingham, 16 May 2013

Site	Grid reference	Site status	Last record date	Recorder	Comments
Speldhurst	TQ54K		(1) June 1991 (2) 1986	(1) EGP (2) JP	(1) Wood in Danemore Park, TQ5440.
High Brooms	TQ54V, includes TQ5940	Roundabout Wood is part of Local Nature Reserve owned by Tunbridge Wells Borough Council	(1) 14 July 2018 (2) 17 September 2016 (3) 4 Aug 2015 (4) After 1990, before 2006	(1) KFC meeting (2) BPS meeting (3)GK & PA (4) EGP & JBe (Philp, 2010)	(1) Roundabout Wood, TQ 5946 4073. Abundant in spring lines. (2) TQ 5947 4073, abundant plants under light shade of mature Alder, in spring lines flushes issuing down gentle slope at top of Roundabout Wood, at junction of Tunbridge Wells Sand and Wadhurst Clay. (3) Roundabout Wood, Grosvenor and Hilbert Parks, where originally discovered by MPa. Present in three locations on a north-east facing slope in dappled shade of alder wood, especially where seepage (presumably from junction of Tunbridge Wells Sand Formation and Wadhurst Clay) keeps the wet peaty ground open from bramble encroachment, although the *Equisetum* also occupied marginal bramble areas. (a) TQ 59498 40724, c.220 stems spread over area at least 6x9m. Associated plants: *Ranunculus repens, Carex remota, Cardamine* sp., *Solanum dulcamara, Hypericum androsaemum, Rubus fruticosus* agg. (b) TQ59475 40741, many stems in area c. 9x18m. Associated plants: *Mentha aquatica, Galium palustre, Fraxinus excelsior, Ranunculus repens, Carex remota, Rubus fruticosus* agg., *Ilex aquifolium, Alnus glutinosa, Dryopteris dilatata, Juncus effusus, Deschampsia cespitosa*. Also, an outlier to this colony of eight stems on a path to the south west. (c) TQ59483 40763, 27 stems in

					small area just over 1x1m around open wet peaty/ferruginous flush. Associated plants: *Rubus fruticosus agg., Hedera helix, Dryopteris dilatata, Fraxinus excelsior, Carex remota, Ilex aquifolium, Viburnum opulus, Alnus glutinosa*. (3) EGP referred (pers. comm.) to the plant as being down a bank on the west side of a minor road, which must be a different site, or an extension of the woodland site. It may well correspond to a location c. TQ 5968 4045 which was known to CAS around 1952 before the Pinewood Road houses were fully built up, spreading from boggy ground into what are now their gardens. (4) TQ54V.
Lamberhurst Quarter	TQ63P		After 1970, before 1981	Philp (1982)	[Flushed slopes of Brooklands Wood searched without re-finding, SL, August 2016.]
East of Lamberhurst Quarter	TQ63U		After 1970, before 1981	Philp (1982)	[as above.]
Pembury Hall	TQ6242		(1) 27 September 2022 (2) 9 June 2014 (3) 16 May 2013 (4) After 1990, before 2006	(1) GK (2)PS (3) SB (4) EGP (Philp, 2010)	(1) TQ 62649 42555, known site, present across c.3m of bank at road junction, opposite side to waterworks. Very close to road itself, damp due to seepage from small gully running down from oakwoods above, presumably a spring line present. Shaded, with south eastern aspect. Associated flora: *Ilex aquifolium*, *Corylus avellana, Calystegia sepium*, *Melica uniflora*, *Crataegus* monogyna, *Alliaria petiolata*, *Taraxacum* agg., *Rubus fruticosus* agg. [January 2023, the habitat appeared to be destroyed by roadworks involving excavation of the bank and installation of drainage below, Not seen in June 2023, although *Equisetum arvense* flourishing, GK.] (2) TQ 62639 42555 ±6m, 10 plants on lower part of lane bank, west of Old Church Road, south-facing, but overshaded by holly and oak. Close to road surface and vulnerable to damage by lorries turning. Apparently well drained and not particularly damp, but may benefit from seepage from nearby springs in scrubby woodland. *Betonica officinalis* and *Luzula forsteri* associated, bank dominated by *Melica uniflora*. (3) 18 plants on roadside bank at TQ 62626 42570 at road junction opposite waterworks. Bank under oak woodland but fairly well lit and on spring line. Accompanying species *Luzula pilosa, Melica uniflora, Carex flacca*. (4) Recorded as TQ64G. Records in this area go back to 1845 (‘Bog near Pembury Church’ – Edward Jenner, Flora of Tunbridge Wells) and the location was variously described by FR as in damp woodland at road T-junction

					near Pembury Church and waterworks (1952) and opposite waterworks on spring line in oakwood on Tunbridge Wells Sand (1962). Cf. record at TQ 626 426, by A. Wilmot in September 1972.
Brenchley Wood	TQ6441	KWT reserve	25 April 1993	SB	Known at least from the 1970s, and continuously from 1985 to 1993, c. TQ 648 419. Just a very small patch under Alder in a wet part of the wood which gradually dried out.
Brookland Wood	TQ6638	SSSI	(1) 25 August 1987 (2) 15 August 1987	(1) JP (2) KFC meeting	(1) TQ 661 388. May be same as 1979 record by FR for wood at Lamberhurst Quarter, but this is given as TQ 659 387 in his MS Flora. [Not found, SL, 2016.]
Knock Wood, Tenterden	TQ8934		1988	JP	c. TQ892347, a peaty flush on a north-facing slope, which also supported *Osmunda regalis*, not re-found when subsequently re-visited by JP, although the site remained suitably wet and boggy. Also not re-found, SL, in 2017; maybe due to overshading, woodland was secondary following clearance between 1870 and 1900.
Near Chartham Hatch	TR05Y	Part KWT reserve	(1) 31 May 2014 (2) 9 May 2011 (3) After 1990, before 2006	(1) BW (2) LR (3) EGP (Philp, 2010)	(1) TR0956 (2) TR 09724 56914 at Hunstead Wood. Most plants (100+shoots) were outside the reserve in a ditch bounding the wood and in the border of adjoining ploughed arable; only scattered plants in the wood. Formerly known from around a woodland pond, but this seems (2011) to have dried up and water table changes may be affecting residual woodland plants as well. In 2013, however, the pond was full, draining to the adjoining field ditch. Hunstead Wood has a long history of records: FR saw it in 1956 by a stream on the east side of the wood and remarked that this was probably the 1899 Flora of Kent site. (2) Denstead Wood (where known at least back to 1957).

Erica cinerea L. (Bell Heather)

vc 15 and 16

Rarity / scarcity status

Bell Heather is widespread in heathland throughout the British Isles, other than in central England, and its conservation status in Great Britain has been one of 'Least Concern'. However, in England there is some evidence of decline, and it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 29% in the likelihood of recording the species. In Kent, it is neither rare nor scarce, albeit more or less limited to west Kent and the Weald, but Philp (2010) shows a decline in tetrad records of 35% over those given in Philp (1982). It is a Kent axiophyte and so indicative of good habitat.

Account

In Kent the first published record for *Erica cinerea* is that of Edward Jacob in his *Plantae Favershamienses* (1777) where he gives it as '*Upon* Charing Heath *–not common*'. Hanbury & Marshall (1899) noted the species as being one of dry sandy ground, frequent near London and on the lighter soils of the Weald, the comparative rarity of *Erica* spp. in Kent being evidently due to the great prevalence of chalk and clay, which they avoid. The reference to metropolitan Kent brings in the acid sandy/gravelly terrain of the north west Kent commons – Blackheath and Keston being mentioned as sites in Daniel Cooper's *Flora Metropolitana* (1836), and Paul's Cray Commons being added for 1904 in the *Woolwich Surveys* (1909).

Pembury Walks. Habitat photo of *Erica cinerea* against a background of *Calluna vulgaris*, by Sue Buckingham, August 2014

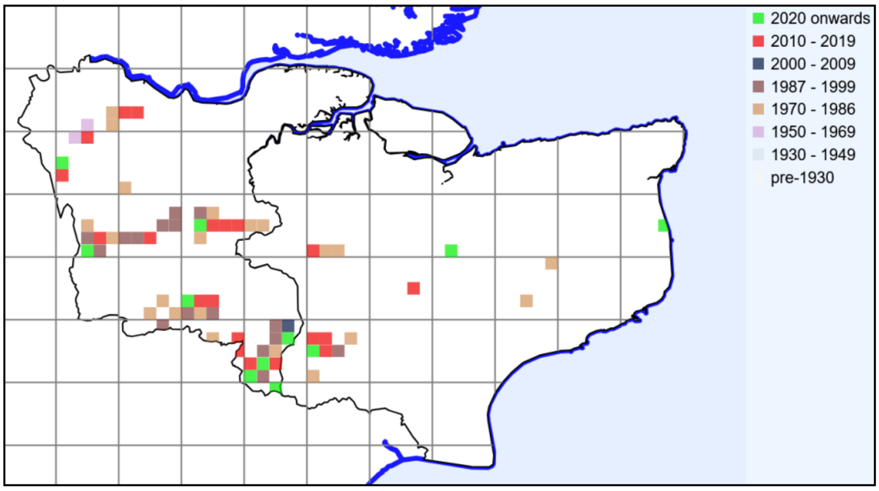
Philp (1982) regarded the species as rather local on dry sandy heaths and woodland rides, its distribution being shown as primarily on the Greensand and the Tunbridge Wells Sands, together with a presence at Dartford Heath (the metropolitan commons being outside the scope of that work). However, the follow-up 1991-2005 survey of Philp (2010) gave a reduction from 52 tetrads to 34, Bell Heather having apparently gone from some sites through loss of habitat.

Pembury Walks. Photo by Sue Buckingham, 16 August 2014

The result is a distribution which resembles a reduced version of that for *Calluna vulgaris* (Heather), given that the latter species was also present in all bar two of the 34 tetrads. Many of the same factors applicable to Heather (see separate account) apply to Bell Heather as well – the reliance on heathland, a habitat which has undergone a long decline in Kent before a degree of reversal, reflecting restoration work largely carried out since the 1991-2005 survey.

However, the position of Heather and Bell Heather in Kent cannot be fully equated, because the recent 35% decline in Bell Heather tetrad records shows greater sensitivity to the causes of decline in Kent than Heather (11% over the same period). This may be a function of smaller populations of Bell Heather placing the species at greater risk. It is generally found together with Heather, but in smaller quantity and not growing in dense uniform stands as Heather may do, so that habitat changes are likely to render Bell Heather extinct at a site before the last Heather disappears as well. Its relationship with Heather in Kent will be worth exploring: elsewhere, it has been noted as on occasion out-competed by Heather or alternatively growing as an understorey to Heather[200].

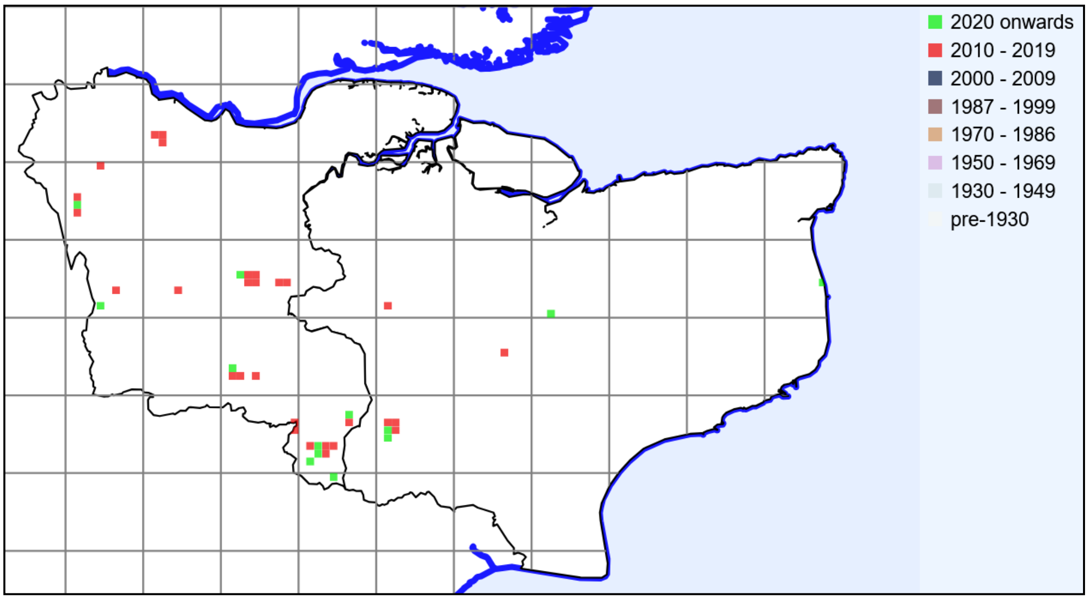
The decline has continued, with our 2010-24 records amounting to 31 tetrads (42 monads). This represents a 46% diminution from the 1971-80 position (making adjustment for those sites in Greater London and so not covered by the earliersurvey). The map below shows the pattern of loss, concentrated on the Greensand and in the High Weald. These may not all be permanent losses, given that cyclical forestry felling may only open up appropriate habitat at long intervals. There is an anomalous 2016 record of a patch on the landward side of the sea bank near Deal, which is assumed to be an introduction.



***Erica cinerea* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The extent of historic records at tetrad level in the preceding map perhaps detracts from the tenuousness of the species' current distribution (other than around Bedgebury and Mereworth, both areas with extensive acid woodland) as appears from the following monad level map which, because recording at monad resolution only became usual from 2010, consists almost wholly of 2010-24 data.

***Erica cinerea* Kent records to 2024 mapped at monad level, from BSBI database.**



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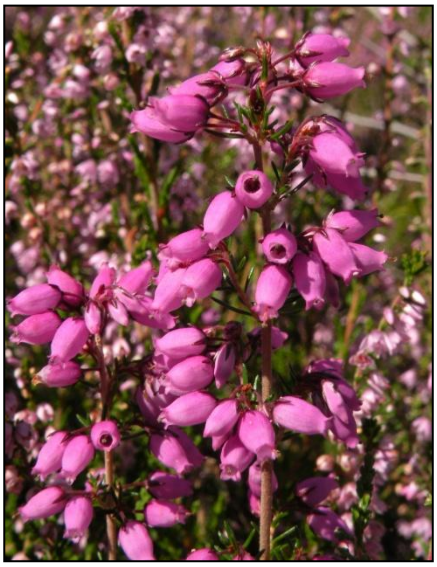
[200] Bannister, P. (1965). *Erica cinerea* L. (Biological Flora of the British Isles). *Journal of Ecology* **53**: 527-542.

Erica cinerea is a plant of well-drained, acid ground without accumulation of humus. Whilst typically favouring open habitats, in Kent it is found particularly in the context of coniferous forests, along paths and rides or where trees have been cleared. This reflects the limited extent of heathland available in the county, as also the commercial use of sandy, infertile terrain. Although recently recorded at Hothfield Common, it is desirable that any such sightings be confirmed in view of the lack of older records and of the likelihood that the wetness of much of the land better suits *Erica tetralix* (Cross-leaved Heath) and *Calluna vulgaris* is also more tolerant to this. It has been suggested that distribution patterns of Bell Heather and Cross-leaved Heath may be affected by the former being more sensitive to the toxic effect of iron in the soil, increased by water-logging and Bell Heather's higher transpiration rate[201]. Seed production is large – up to half a million seeds per square metre from a mature plant – and germination can be enhanced by heat treatment[202], which may be relevant to fires which occur from time to time at Dartford Heath.



Pembury Walks. Photo by Sue Buckingham, 16 August 2014

Erica cinerea may be distinguished from *Calluna vulgaris* by its larger flowers, and by the leaves spreading in whorls, not opposite/adpressed; it also flowers earlier (mostly July to early August). From the downy *Erica tetralix* it may be separated by virtue of being hairless. A variant (var. *schizopetala*) with the corolla split nearly to the base, and so appearing to have four petals, was collected by two botanists in 1897 at Crockham Hill Common[203]. This variant seems capable of reproducing by seed, as it did spontaneously in David McClintock's garden at Platt, from a plant of non-Kent origin.

Crockhamhill Common, habitat. Photo by Geoffrey Kitchener, 29 December 2014

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[201] Discussed, and sources given, in Webb, N. (1986). *Heathlands.*

[202] Bannister P. (1965), cited above.

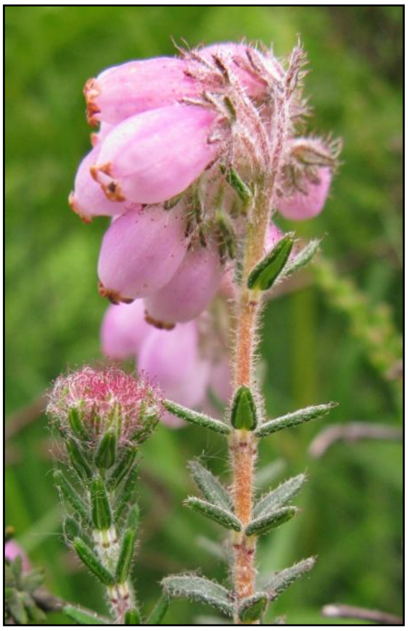
[203] McClintock, D. (1980). Bell heathers with split corollas. *The Plantsman* **2**: 182-191. G.C. Druce also referred to a plant from Edenbridge sent to him by a Mr Dickinson, *Journal of Botany* (1902) **40**: 352.

Erica tetralix L. (Cross-leaved Heath)

vc 15 and 16

Rarity / scarcity status

Bell Heather is widespread in mires and wet heaths throughout the British Isles, other than in central England, and its conservation status in Great Britain has been one of 'Least Concern'. However, in England there is some evidence of decline, and it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 29% in the likelihood of recording the species – the same as that for *Erica cinerea* (Bell Heather). In Kent, it is (taking account of metropolitan vc16 records) on the verge of being scarce, and Philp (2010) shows a decline in tetrad records of 38% over those given in Philp (1982), although our subsequent records do not support that decline. It is a Kent axiophyte, and so is an indictor of good habitat.

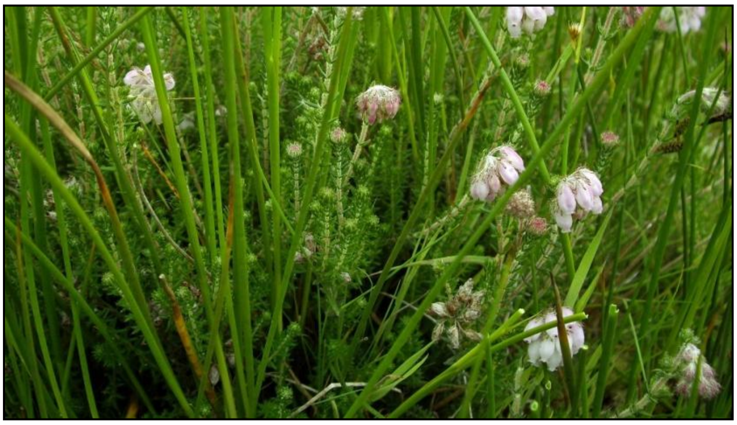


Hothfield. Photo by Sue Buckingham, June 2012

Account

The first published Kent record for *Erica tetralix* is given by Hanbury & Marshall (1899) as Edward Jacob's reference in his *Plantae Favershamienses* (1777) to the species being found, but not common, 'A*t the Bottom of* Jud's Wood' (there is still a Judd's Wood, south west of Ospringe, on the Thanet Formation, which could provide an acid sandy substrate). However, the herbarium of Dillenius (1684-1747) contains a Tonbridge specimen which G.C. Druce credited as the first for Kent[204].

Hanbury & Marshall (1899) considered it to be local[205] on moist heaths, preferring a somewhat loamy sand. They noted historic records on the north west Kent metropolitan commons – Keston, Blackheath and Chislehurst – and mentioned records in heaths elsewhere, such as Benenden Heath and Hothfield. However, it is possible that the species was not restricted to moist heaths, for they gave woodland records as well: Seal Chart and Chiddenden Wood (near Cranbrook), as well as Jacob's original record in Jud's Wood. The species develops best in the open, but is capable of withstanding shade of Scottish woodland with a daylight factor of 1/3 to 1/6[206]. On the other hand, it may that the Kent woodland name has been assigned to a site which actually represented open ground there.



Hothfield, habitat, amidst *Juncus* and *Carex* spp. Photo by David Steere, 2 July 2013

Francis Rose knew it (1940s-60s) as present in 20 localities: in wet-heaths, valley bogs; and locally abundant, but generally rare, and absent from all of north east Kent and the chalk and marsh districts. He considered its main centres to be the north west

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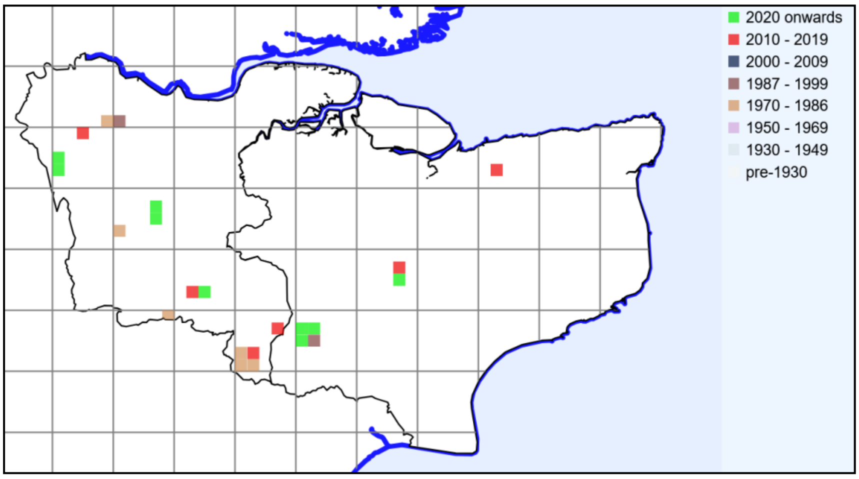
[204] G.C. Druce (1907). *The Dillenian Herbaria, Oxford*. This was marked as '*Satis frequens in collibus circa Acidulas Tunbridgenses*' (frequent enough in the hills around acid [lands?] of Tonbridge), but it cannot be ruled out that reference was being made to the south of Tunbridge Wells, in Sussex.

[205] Marshall was a little more forthright in the *Victoria History of the County of Kent* (1908), where he declared the species to be very rare except on the moist sands of three of the botanical districts making up the county.

[206] Cited in P. Bannister (1966). Erica tetralix L. (Biological Flora of the British Isles). *Journal of Ecology* **54**: 795-813.

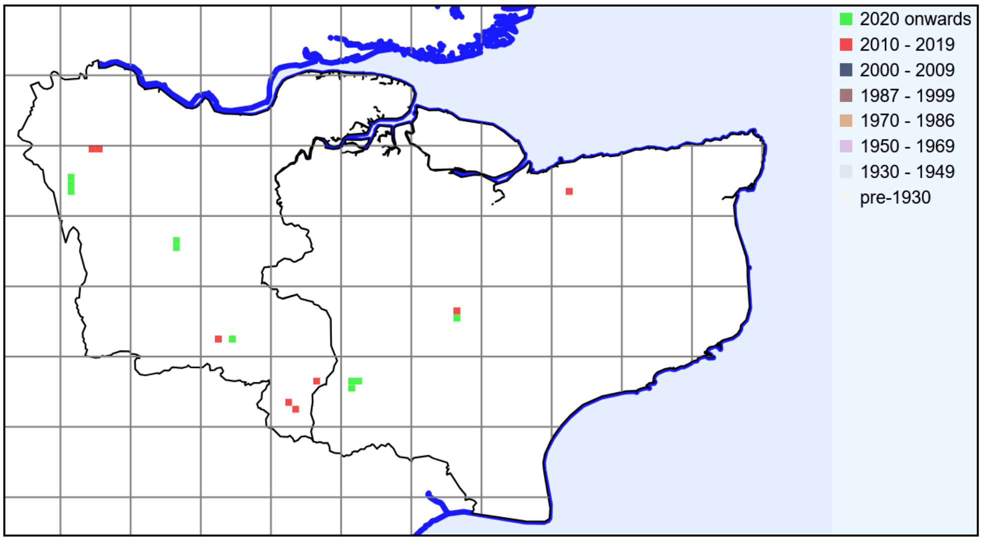
Kent heaths, Hothfield Common and the High Weald woods between Tunbridge Wells and Biddenden; it had presumably been much commoner on the sands of the Folkestone Formation before most of the heaths were enclosed and cultivated.

By the 1971-80 county survey (Philp, 1982), it was regarded as rather local and scarce in Kent because of the lack of suitable habitats (bog and wet heaths) and it was recorded in only 13 tetrads in the administrative county. That number reduced to eight tetrads by 1991-2005, although three of those tetrads represent sites where it was not recorded in 1971-80. It is not clear whether this is a consequence of the recording process, or whether there is a degree of coming and going of the plant with changes in habitat. However, the central issue for this species in the county is habitat availability. Heathland has long been in decline in Kent, with a slight recent reversal due to restoration work, as described in the account for *Calluna vulgaris* (Heather); but any reversal really needs to bring back wet heathland for *Erica tetralix*, in spite of some historic records for probably drier locations. *Erica tetralix* copes with much wetter conditions than either *Calluna vulgaris* or *Erica cinerea*, and is more tolerant of iron toxicity than the latter in these circumstances[207]; and accordingly in such habitats can avoid being out-competed by the other heaths. On the basis of Philp (1982), *Erica tetralix* is four times scarcer in the administrative county than *Erica cinerea* and 35 times scarcer than *Calluna vulgaris.* This must at least in part reflect the scarcity of wet heathland or bog in comparison with similar, but drier, ground.



***Erica tetralix* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The distribution map for tetrad records shows fewer losses (proportionately and absolutely) than for *Erica cinerea*.



***Erica tetralix* Kent records to 2024 mapped at monad level, from BSBI database.**

From mapping at monad resolution, we gain a better understanding of the sparsity of occurrence. These mapped records are all recent (2010-24), because recording at monad level only became usual in Kent from 2010. They include finds at Keston, St Paul's Cray, Pembury Walks (in wet areas over *Sphagnum*), Angley, Clowes and Brenchley Woods, Bedgebury and

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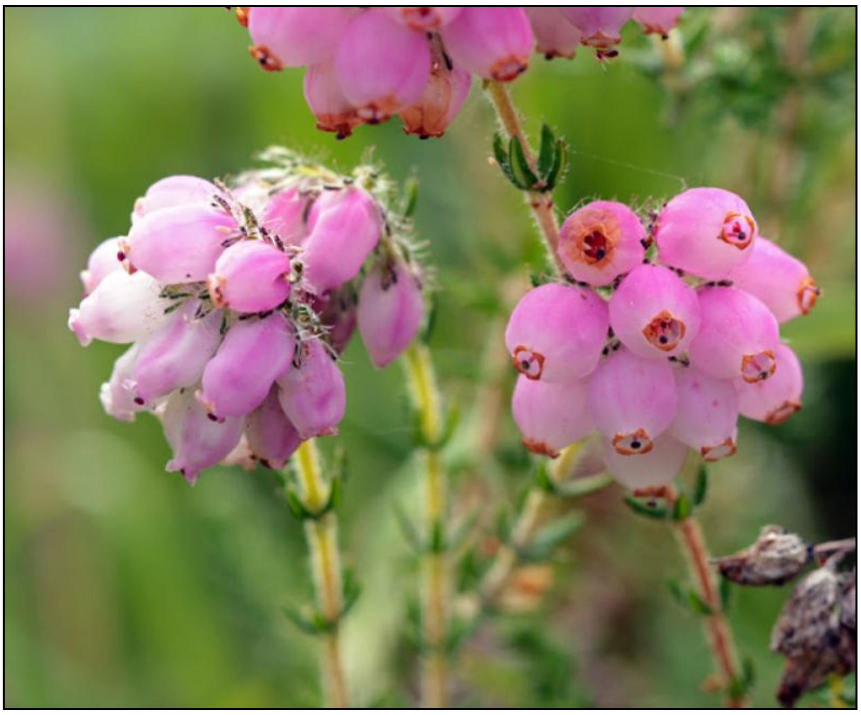
[207] Discussed, and sources given, in Webb, N. (1986). *Heathlands.*

Hothfield. Records for 2010-24 (15 tetrads, 18 monads) have caught up with those in Philp (2010) irrespective of the inclusion of metropolitan vc16. That is almost the case in relation to Philp (1982) as well, adjusting for Greater London, so the apparent decline between the 1970-81 and 1991-2005 surveys is not confirmed, and perhaps even more records could be obtained from any wet open terrain at Joyden's Wood, Petts Wood, Whitley Forest and Bedgebury.



Hothfield. Photo by David Steere, 17 July 2016

Cross-leaved Heath is an evergreen perennial shrub, bushy if growing in isolation on drier ground, straggly with lower branches ramifying through moss and litter on wetter ground. Its leaves are set in whorls of (generally) four- hence both English and Latin names – which distinguish it from Bell Heather (whorls of three) and from Heather (opposite leaves in rows). Its hairiness distinguishes it from Bell Heather, and also provides a greenish-grey foliage colour which enables it to be identified at a distance. The flowers are urn-shaped, distinct from those of Heather, and generally slightly larger than Bell Heather flowers.

Eriophorum angustifolium Honck. (Common Cottongrass)

vc 15 and 16

Rarity / scarcity status

Common Cottongrass is indeed common over much of the British Isles, where there are suitable habitats, and the risks to this species are regarded in Great Britain as a whole as being of 'Least Concern'. In central and south east England, however, it is in long term decline and now largely absent. Accordingly, its English status is, through drainage and loss of traditional grazing management, **Vulnerable** to extinction. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 33% in the likelihood of recording the species. Southern counties such as Hampshire and Surrey still possess enough acid bogs to supply habitat for this species, but there is very little suitable terrain in Kent, where it is **scarce**. It is a Kent axiophyte, and so is an indictor of good habitat.

Account

Hanbury & Marshall (1899) refer to a 1682 manuscript list in John Ray's *Catalogus Plantarum Angliae* then at the British Museum which gave this species as at Pett Bog, Chislehurst – this appears to be the first Kent record. Post-1682 records have been thinly but widely spread over the county, avoiding the chalk. *Eriophorum angustifolium* was considered to be rather scarce in the county by 1899 ("thinly distributed" was Marshall's comment in 1908).

Hothfield. Photo by Geoffrey Kitchener, 25 May 2010

In the 1940s and 1950s it was known to Francis Rose from Gibbin's Brook, from fen meadow east of Hacklinge and (surprisingly) from Swanscombe Wood[208]. Overall, he knew of eleven localities, and treated it as a plant of fens, valley bogs and wet heaths in acid (pH 3-5) to calcareous (pH7.5) waters; also in artificial ponds and ditches, probably once being common on the Lower Greensand bogs.

Hothfield. Photo by Lliam Rooney, 15 June 2010

By the time of Philp (1982) the species was apparently gone from several former localities through land drainage or lowering of the water table. It was then (1971-80) only noted in two localities, Hothfield Common and Hawkenbury Bog. The latter site, however, was actually in vc14, East Sussex, and in any event afterwards lost its character through drying out. The subsequent survey of 1991-2005 (Philp, 2010), however, located Common Cottongrass in four tetrads. To these must be added its continued presence at Keston Bog, excluded from Philp (2010) because in metropolitan West Kent. These further locations include two tetrads at Dungeness which do not seem to represent an expansion of the plant, but rather its continuance, albeit not mentioned in Philp (1982). It was known at Dungeness to Hanbury before 1899 and collected at Denge Beach in 1934 (specimen at University of Birmingham herbarium). Francis Rose recorded it in fen conditions by the Dungeness Open Pits (1945-62).

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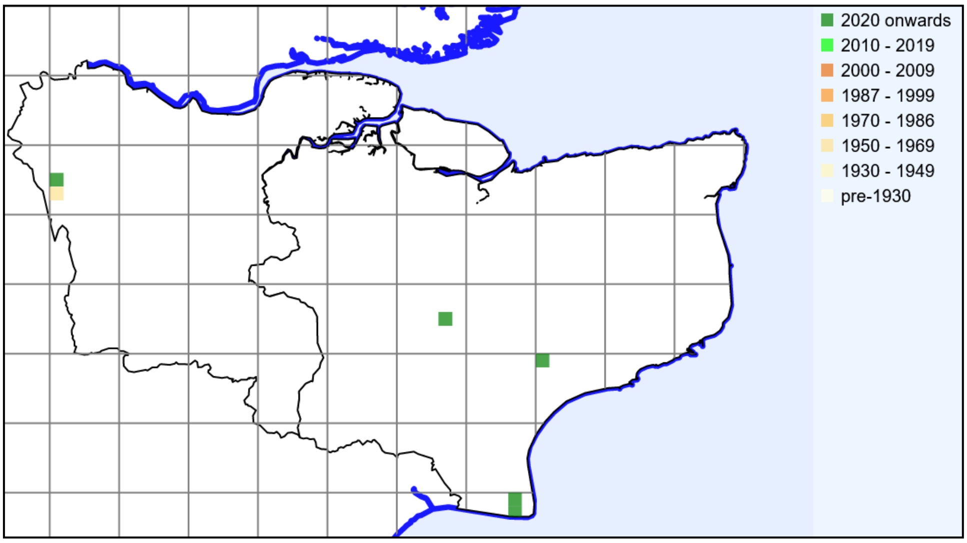
[208] This was actually in the cutting of an old mineral railway leading from Swanscombe Park towards an old chalk pit near Southfleet Road, and one may surmise that it was introduced in the course of the mineral working. The geology was probably Thanet or Lambeth Sand, so as to provide acid conditions; but the whole area was subsequently excavated down to the chalk, becoming Eastern Quarry, east of Bluewater.

Both Hothfield and Keston are old localities. The presence of Common Cottongrass at Hothfield was communicated to the authors of Hanbury & Marshall (1899) by Frederick Webb, who died in 1880. The species was also listed for Keston Mark or Common by Daniel Cooper in his *Flora Metropolitana* (1836), representing the results of excursions in 1833-35; it was still abundant in what was described by W.H. Griffin in 1906 as a boggy valley at the common, doubtless Keston Bog; and it still survives there.



***Eriophorum angutifolium* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Recent records (2010-24) amount to five tetrads (five monads), on a par with the 1991-2005 county survey, adjusting for Greater London.

Eriophorum angustifolium is nationally found in a range of acid communities, whether bogs or wet heaths, and its Kent localities are characterised by an acid peaty substrate, often with standing water, through which its extensive rhizomes spread. Although the 'cotton' appears to be an adaptation for wind dispersal of seeds, spread generally seems to be vegetative. It has been maintained that the current British climate is unsuitable for the establishment of seedlings[209], and on this basis expansion beyond existing Kent sites would seem unlikely. It is a distinctive plant when in flower or fruit, and other *Eriophorum* species are either not known in Kent or have not been seen for many years.

Hothfield. Photo by Lliam Rooney, 19 April 2011

Site	Grid reference	Site status	Last record date	Recorder	Comments
Keston Bog (metropolitan vc16)	TQ4164	SSSI	(1) 16 July 2022 (2) 24 June 2022 (3) 6 August 2016 (4) 28 May 2011 (5) 13 June 2007	(1) LNH meeting (2) SLo (3) SL (4) OFC meeting (5) JP	(1) TQ4164. (2) TQ 417 643, Keston Common. (3) Keston Bog, small valley between TQ 4170 6423 and TQ 4171 6434. (4) TQ 417 643. (5) TQ 41715 64324, in middle marsh area of bog.
[Hawkenbury Bog]	[TQ43Y]		[After 1970, before 1981]	[Philp (1982])	Since gone from this location, which was in vc14, East Sussex.

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[209] M.E. Phillips (1954), Biological Flora of the British Isles. *Eriophorum angustifolium* Roth. *Journal of Ecology* **42**: 612-622.

Hothfield Common	TQ9645	SSSI, KWT managed reserve	(1) 22 June 2022 (2) 11 June 2020 (3) 1 July 2019 (4) 2 June 2019 (5) 17 July 2016 (6) 8 August 2015 (7) 25 May 2010 (8) 1 June 2009 (9) After 1990, before 2006	(1) AL (2) AL & JM (3) AL & JM (4) AW (5) AW (6) BW (7) GK (8) IR (9) EGP (Philp, 2010)	(1) TQ 968 456. (2) TQ 9698 4536, typical stand in Bog 1. (3) M21 *Narthecium ossifragu*m valley mire by boardwalk in Bog 2; M29 *Hypericum elodes* soakway at top of bog 2; M6 *Carex echinata* mire at middle of bog 2; and M21 *Narthecium ossifragum* valley mire at middle of Bog 2. (4) TQ9645 (5) Main bog. (6) TQ9645. (7) TQ9645, abundant across the whole width of (main) Bog no.2, including in standing water; less common in Bog no.1 to south. (8) TQ 969 453, Bog no. 1; TQ 968 456, Bog no.2; TQ 968 459, Bog no. 3. (9) Recorded as TQ94S
Hothfield Common	TQ9646	SSSI, KWT managed reserve	(1) 11 July 2019 (1) 1 June 2009	(1) AL (1) IR	(1) TQ 9673 4610 and TQ 9674 4611, Bog 4. (1) TQ 967 460, Bog no. 4.
Dungeness	TR01T, include TR0717	SSSI	(1) 30 April 2022 (2) 10 July 2016 (3) 2012 (4) After 1990, before 2006	(1)SL (2) KBRG/KFC meeting (3) BB & BF (4) EGP (Philp, 2010)	(1) Dungeness SSSI (Unit 25), Open Pit 4, *Eriophorum / Sphagnum* bog on the northern side of pit. Area of Sphagnum appears to have increased despite encroaching unmanaged *Salix*. (2) Open Pit 4, acidic marsh on managed northern edge, Denge Beach, Dungeness, TR07281776. (3) TR0717. (4) Recorded as TR01T. In 1983, it was recorded as occasional in marsh at the Open Pits, nos. 2 & 4[210], both in TR0717, but (comm. BB from unpublished English Nature survey data) it had gone from pit 2 by 2002, albeit then present in 4 & 8 (the latter in TR0718) in small unshaded areas. On re-survey in 2012, presence in pits 4 & 8 was recorded in additional transects following *Salix* clearance.
Dungeness	TR01U	SSSI	(1) 15 June 2010 (2) 25 June 2005 (3) 13 May 2004	(1) GK (2) PAk (3) EGP	(1) A few plants in wet area of pit no. 8, where *Salix* cleared, TR 072182. (2) TR 074 183. (3) Recorded as TR01U.
Gibbin's Brook	TR1138	SSSI, Access land	(1) 28 June 2023 (2) 30 June 2013 (2) 28 April 2011 (3) 18 June 2003	(1) & (2) KBRG meeting (2) LS & AG (2) EGP & BW	(1) southern mire, a small patch at TR 11589 38526 with one fruting stem. (2) Same patch seen as found in 2011 thriving at TR 116 384, together with small secondary patch in vicinity. (2) Marshy grassland on peat with sphagnum moss. (3) Recorded as TR13E.
Ham Fen	TR3454		24 July 1991	FR	

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[210] B. Ferry & A. Henderson (1984): The vegetation of natural freshwater pits at Dungeness – I: Higher plants. *Transactions of the Kent Field Club* 9: 143-153.

Erodium maritimum (L.) L'Hér. (Sea Stork's-bill)

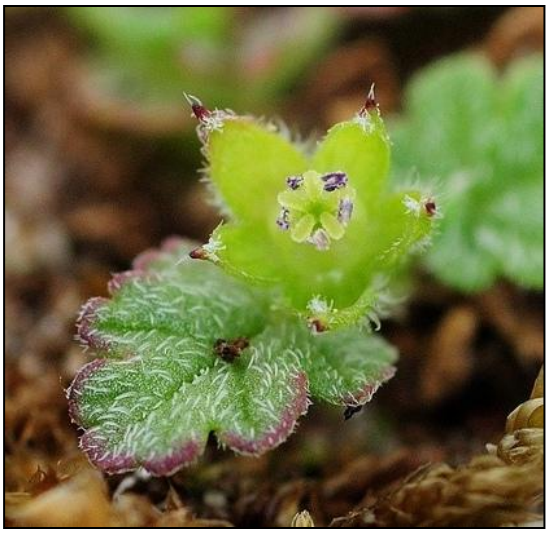
vc15

Rarity / scarcity status

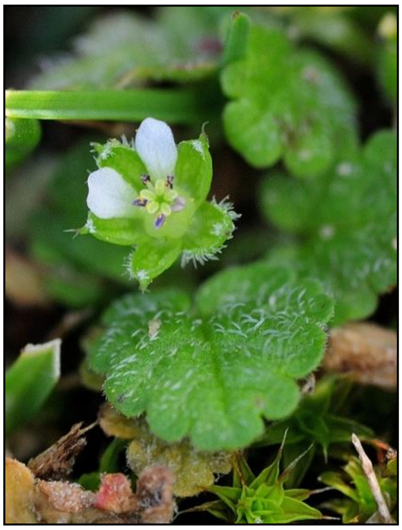
The core distributional range of Sea Stork's-bill in the British Isles is along the British west coast northwards to the Rhinns of Galloway and southwards to Cornwall, thence to Dorset with a few outliers further east. It is also on the east and south coasts of Ireland. Although it had been noted as a species in marked decline in south east England[211], there appear to be no conservation concerns, its risk status being one of 'Least Concern' both for England and for Great Britain as a whole. Kent is one of the eastern outliers, and so on the fringes of British distribution; the species is **scarce** in the county.

Account

Erodium maritimum was first recorded in Kent by Edward Jacobs in his *Plantae Favershamienses* (1777) as present "*On the Sand Downs near* Deal – *not common*". The likelihood is that this record was a contribution by William Boys, the historian of Sandwich. It was later listed by Lewis Dillwyn as "Found by my friend, Joseph Woods, jun. and myself on the walls of Sandgate Castle" in *his Catalogue of the more rare Plants found in the Environs of Dover, with occasional Remarks* presented to the Linnean Society in 1801 and appearing in their 1802 Transactions.



Dungeness. Photos by Lliam Rooney, 20 July 2010



After this, nothing was heard of the plant until recent years, although Hanbury & Marshall (1899) were hopeful that careful search at Deal might be successful. In 1996, however, it was rediscovered on sandy tracks on the Dungeness RSPB reserve (TR0618) and since then it has spread prolifically along paths in the reserve, being recorded in thousands, and from 2010 began to be observed in other locations. By 2012 it was also known not far from the original location, having been found in monads TR0619, TR0716 and TR0817, but additionally had been recorded further afield in a car park on secure MoD land at Lydd Ranges, TR0320. In 2017, there was added an anomalous inland record at Hothfield, where it appeared either from imported sand or from a scraped-up car park surface to which it may have travelled with visitors from the Dungeness reserve. A range extension to the north Kent coast was observed in 2023, with hundreds of plants seen on pathways leading down to the shore at Conyer. The total for 2010-24 records comprises eight tetrads (12 monads).

Although the species is known in other parts of the British Isles from sea cliffs and sand dunes, the south east Kent plants inhabit low-lying compacted shingle or sand/shingle surfaces of car parking or paths where they grow with a prostrate, flattened habit. The very small size of this annual renders it susceptible to over-shading competition and little else grows with it in its trampled environment. It is probably self-pollinating and, without a need to attract pollinators, often lacks petals or drops them readily (see illustrations above).

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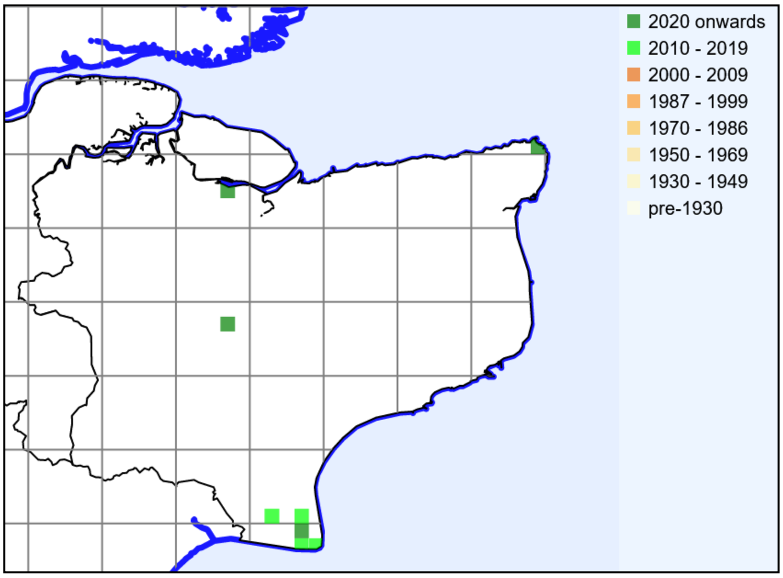
[211] Walker, K.J. (2007). The last thirty-five years: recent changes in the flora of the Britih Isles. *Watsonia* **26**: 291-302.



***Erodium maritimum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Although Sea Stork's-bill was native to Kent, it is likely that its appearance on the RSPB reserve is as a result of seed being brought inadvertently on footwear or car tyres of a birdwatcher from a coastal site in western Britain. Thence a similar means of dispersal probably accounts for the spread to Hothfield and Conyer. Normal dispersal for the seeds of *Erodium* spp. is by explosive release and self-burial, but Sea Stork's-bill's spread along paths suggests that seeds are readily capable of being picked up with wet sand and gravel on footwear.

Dungeness. Photo by Sue Buckingham, 20 August 2011

Site	Grid reference	Site status	Last record date	Recorder	Comments
Conyer north	TQ9665		20 May 2023	AL & JM	TQ 961 650. Revisited on 19 November 2023 and found to be plentiful on the side of the path in the former brickworks (TQ 9609 6513, TQ 9607 6515), in very thin soil over concrete, and abundant (hundreds of plants) along the gravel track (TQ 9615 6545) down to the shore.
Hothfield	TQ9746	SSSI	(1) 14 January 2024 (2) 8 August 2017	(1) AL (2) HS	(1) TQ 9706 4600. Hundreds of plants all along the sandy bank. (2) TQ 9705 4600, over 20 plants (spreading along sandy bank which was constructed 2013 (info per Ian Rickard, KWT) when the adjoining land ceased to be a car park, at which point the tarmac/gravel surface was scraped off and used to create this bank. Two or three years later a neighbour

					supplemented it with additional sandy material.
Lydd Ranges	TR0320	MoD land	(1) 7 August 2012 (2) 8 August 2012	(1) OL, GK, TI & SB (2) SB & TI	(1) At car park, Lydd Camp. (2) Many plants at edge of road by MOD car park TR 03477 20013.
Dungeness	TR0617		10 August 2013	TI	
Dungeness RSPB reserve	TR0618	RSPB reserve, SSSI	(1) 22 October 2023 (2) 29 September 2017 (3) 23 June 2010 (4) 3 June 2010 (5) 16 November 2007 (6) 29 April 1999	(1) SB (2) BBe (3)SB (4) DG (5) RG (6) EGP	This monad has been the subject of records by many recorders since 1996 to (at least) 2012, and a selection is given here. (1) still present on the RSPB reserve in car park TR 0677 1844 and along public footpath/ trail, to at least TR 0677 1821. (2) TR 06774 18442, RSPB car park, a few plants. (3) TR 067 181 to TR 067 184, thousands of plants. (4) TR 067 184, in car park and on paths throughout the reserve. (5) TR 065 185, TR 066 184, TR 067 184. (6) Location given as TR01U.
Dungeness	TR0619	Mostly SSSI	(1) 1 May 2019 (2) June 2014 (3) 18 April 2011 (4) 15 June 2010	(1) AW (2) FJR (3) SB (4) GK	(1) TR0619 (2) TR 0628 1944, TR 0625 1962, TR 0625 1963, TR 0624 1962, TR 0623 1960, TR 0622 1960. (3) On shingle at TR 06420 19490. (4) ARC site..
West of Lade	TR0620		(1) June 2014 (2) 30 June 2012	(1) FJR (2) TI	(1) TR 06840 20140, c.10 plants, and TR 06796 20168.
Near Dungeness power station	TR0716	SSSI	(1) 15 September 2017 (2) 22 June 2014 (3) 20 August 2011	(1) BBe (2) BW (3) SB	(1) TR 07361 16673, large patch at least 30 x 10m. (2) – (3) TR 07754 16647, abundant on sand and shingle on both sides of concrete road westwards for 600 metres.
Dungeness power station	TR0717		22 June 2014	KBRG meeting	Growing abundantly on the sandy margins of the power station car park.
West of Lade	TR0720		15 June 2013	TI	
Dungeness	TR0817	Mostly SSSI	(1) 4 June 2011 (2) 14 May 2005	(1) TI (2) JS	(1) TR 081 177. (2) TR 08525 17266, 109 plants confined to small area (1 sq metre) by Bird Observatory.

Erophila glabrescens Jord. (Glabrous Whitlowgrass)

vc 15 and 16

Rarity / scarcity status

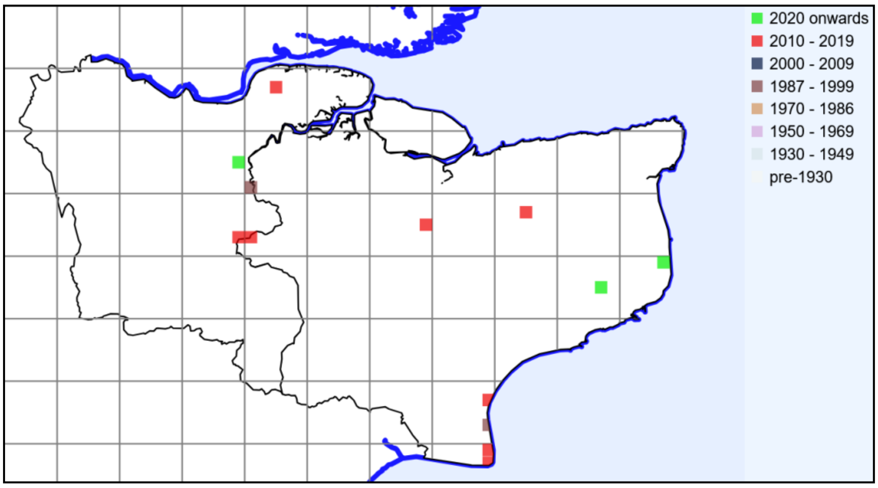
Erophila glabrescens is a plant whose distribution is known imperfectly, because it is not always easy to distinguish from *Erophila verna* (Common Whitlowgrass). However, it appears to be distributed widely, but perhaps patchily, in the lowlands of the British Isles, and presents no particular conservation concerns for England and Great Britain as a whole. In Kent, it has only been identified on a few occasions and with increasing knowledge is being assessed as no longer rare, but instead **scarce**. It is possible that it may eventually be found not to warrant rare plant register status.

Hockley. Photo by Lliam Rooney, March 2011

Account

The earliest record identified so far is a specimen at Kew Herbarium from 1893, gathered at Oldwall (presumably Old Walls, Church Road), Hythe and determined by Tim Rich. There are also specimens similarly determined and which were collected by H.E. Fox from Walmer-Deal (1915, National Museum of Wales Herbarium), and Kingsdown-Deal (1916, Oxford University Herbarium); by J.E. Lousley from Hythe Rifle Range (1927, Reading University Herbarium); and there is a specimen from Chislehurst Common in the Natural History Museum.

Although *Erophila glabrescens* was first named in 1852, it was not until 1987 that its recognition as a species became the norm in British Botany, through inclusion in the *Flora of the British Isles* by A.R. Clapham, T.G. Tutin and D.M. Moore. In consequence, all Kent *Erophila* records in Philp (1982) were treated as *Erophila verna.* The split of this taxon so as to recognize *Erophila glabrescens* as separate was reflected in the Kent survey of 1991-2005, published as Philp (2010). There, Eric Philp stated that he had taken great care over the identification of *Erophila,* but many specimens seemed to vary on the same plant as to stem hairiness or petal shape, characters used to distinguish between *Erophila verna* and *Erophila glabrescens*. He assigned any doubtful plants to *Erophila verna* and was left with only three tetrad records for *Erophila glabrescens*. These were from Teston, Eccles and Greatstone. Our recent records (2010-24) are for 11 tetrads (12 monads).

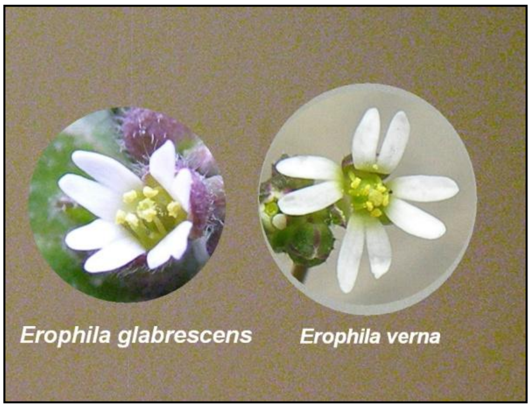


***Erophila glabrescens* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Other Kent recorders have also experienced difficulty with this taxon. It does not seem to have habitat preferences distinct from those of *Erophila verna*; both species can be found together; and frequent sampling from Whitlowgrass colonies can be a wearisome activity. The species are keyed apart on the basis that *Erophila verna* has petioles as long as the leaf blades (or less, down to half as long); petals are bifid from half to three quarters to the base; and the plant is usually hairy. *Erophila glabrescens* has petioles from one and a half to two and a half times as long as the leaf blades, petals are bifid for no more than half their length, and the plantis usually sub-glabrous. It is, however, often not easy to identify the boundary between petiole and leaf for measurement purposes. Also, "usually hairy" and "usually sub-glabrous" imply that there is potential for overlap of hairiness; and in any event, the density of pubescence changes with development and hairs tend to be lost with age. There are therefore risks of mis-determination of plants other than those which have petals clearly divided less than half-way, and scapes which are glabrous or virtually so.

Upper Halling, habitat Photo by Sarah Kitchener, 21 March 2020

What we are able to say about the Kent status of *Erophila glabrescens* so far, however, is that historically this small, early-flowering annual was present on the sandy / shingly east coast, and there have been recent finds which demonstrate some continuity; its inland records on roadsides, car-parks and the like do not show any particular pattern, other than car access, but there has been a degree of persistence at its Teston site; and that the preponderance of records is in East Kent, with some West Kent records being close to the vice county border.



Erophila glabrescens from Littlestone; *Erophila verna* from Teston. Photos by Lorna Holland, 2011

Site	Grid reference	Site status	Last record date	Recorder	Comments
Wateringbury - Teston	TQ6953		(1) 6 March 2011 (2)15 May 2010	L&DH	(1) TQ 69707 5391, prolific on kerb-side by A26. (2) TQ 69714 53394, A26, verge in front of 64, Tonbridge Road. Later flowering than most *Erophila.*
Upper Halling	TQ6964		21 March 2020	GK & SK	TQ 6908 6444, patch on bare ground by farmyard, Petals split to 1.5mm out of total length of 3.5mm. Few hairs only towards base of scape; petiole and lamina not well separated.
Teston	TQ7053 TQ75B		(1) 6 March 2011 (2) After 1990, before 2006	(1) L&DH (2)EGP (Philp, 2010)	(1) TQ 70175 53466, TQ 70175 53466, reappeared on turf-soil after being weed -killed last year. (2) Recorded as TQ75B.
Cliffe	TQ7477		30 March 2012	SA	TQ 74193 77668. Petals split to half length and petioles appreciably longer than leaf blades, especially in lower leaves. However, within the same patch were some plants not well fitting either E. *verna* or *E. glabrescens*.
Eccles	TQ76A		After 1990, before 2006	EGP (Philp, 2010)	
Wouldham	TQ76C		May 1987	EGP	Ministry of Defence land.

Hockley, near Throwley	TQ9855		11 March 2011	LR	TQ 98074 55511, Hockley, near Throwley. On Stalisfield Road, just before it reaches Church Road and Kettle Hill Road. By large stones on imported gravel/shingle by the road side.
Dungeness –Old Coastguard Cotts	TR0817		15 May 2010	TI	
Dungeness – Long Pits	TR0818		2011	TI	
Littlestone Warren	TR0826	SSSI	9 March 2011	L&DH	TR 08895 26770 and TR 08774 26368. The plants were minute but abundant all over the dunes, too early for any seeds.
Dungeness	TR0917		2011	TI	
Greatstone	TR02W		After 1990, before 2006	EGP (Philp, 2010)	
Canterbury	TR1457		14 January 2014	EB	Several plants at Rosemary Lane car park.
Lydden	TR2645		17 February 2024	SB	Edge of a parking area in Lydden at TR 26950 45501, Stonehall. Plants with conspicuously shiny leaves, glabrous except at margin. Petioles noticably long and petals cleft to halfway, no more.
Kingsdown	TR3748		16 February 2022	SB	On broken tarmac and gravel in St James Road TR 375 483. Petals 2 .6 mm, cleft to 1.2 mm. Leaves shiny and almost glabrous mostly with long petioles. One leaf measuring 16mm with lamina just 5 mm. Stems glabrous with very few hairs at base.

Ervilia sylvatica (L.) Schur (= *Vicia sylvatica* L.) (Wood Vetch)

vc 15;long gone from vc 16

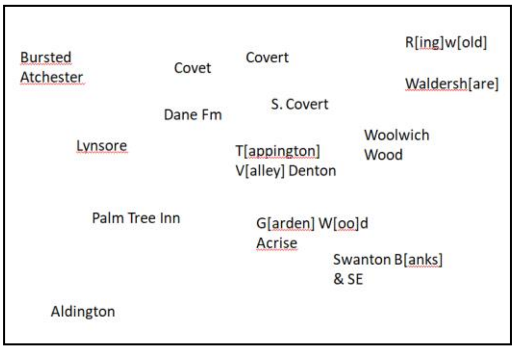
Rarity / scarcity status

Wood Vetch grows scattered across much of the British Isles, but is local and largely absent from the south east, so the Kent populations are a somewhat surprising outlier. Its conservation risk status is one of 'Least Concern', in both Great Britain as a whole and England, in spite of appreciable decline if pre-1930 records are taken into account. It has always been an unusual plant in Kent and is currently **scarce.** It is a Kent axiophyte, and so is an indictor of good habitat.

Atchester Wood. All photos by Lliam Rooney, 27 June 2011

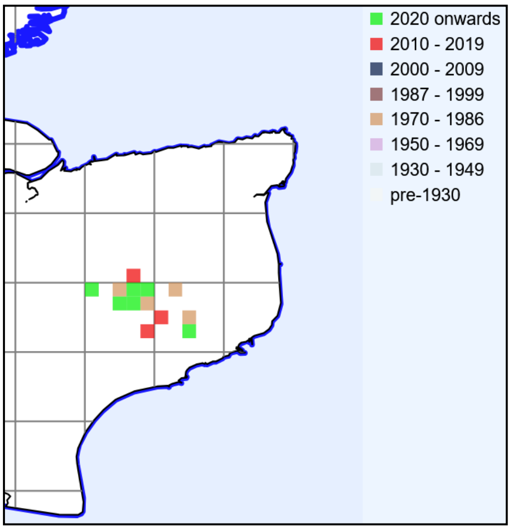
Account

The first published Kent record for *Ervilia sylvatica* is its discovery between Lyminge and Elham by the Rev. Ralph Price, the botanical mentor of G.E. Smith, who incorporated it in *A Catalogue of rare or remarkable Phaenogamous Plants, collected in South Kent* (1829). In his notes 1830-33, Smith also recorded it as present 'In the lane upon Aldington Knowle. On a bank of copse-wood, looking E. or N.E. in Coller's-wood, between Elham and Barham'. At Aldington Knoll, it was still present by the B2067 at least until 1958 (Francis Rose). The Coller's-wood site may bear a relationship to Collardshill Wood, where still present in 2020. Either Smith's publication prompted further searches in East Kent, or it was already known there, but ten years later Matthew Cowell's *A Floral Guide for East Kent, etc.* (1839) gave further records: about Dover (Mrs. W. Sankey); in the woods at Waldershare (Miss Harvey) and at Woolwich and Covert Woods, Barham (Miss Kenrick). So by then what remains the core distributional area in Kent was known. Hanbury & Marshall (1899), referring to it a very local plant of hilly woods and shady hedges, provided further records which, to the extent that they were correct, point to a wider distribution in West Kent (e.g. Eltham, Cobham, Tonbridge, Sevenoaks, Allington, Maidstone) which does not seem to have survived the nineteenth century.



Francis Rose sketched the core distribution area for the purposes of his manuscript *Flora of Kent* (given here in expanded and typed form). He regarded it as a native of borders of woods, and of rides in woods, and in coppice on chalk, base-rich loam over chalk, and on ragstone. Philp (1982) found it in nine tetrads on roadsides and in open woodlands in the Stelling Minnis–Barham area, still in fair quantity within this area, but appearing to have gone from its other stations. However, by 1991-2005 (Philp, 2010) it was only recorded at Atchester and Covert Woods, viz. two tetrads. This apparently catastrophic decline is not borne out by subsequent recording. For the period 2010-24, Wood Vetch was found in nine tetrads (12 monads), again within the core distribution area, but surprisingly not including four of the 1971-80 (Philp, 1982) tetrads.

The very local nature of its Kent occurrence is shown by the accompanying distribution map (although this does not include the Waldershare and Ringwould outliers, as they are not in the BSBI database)



***Ervilia sylvatica* East Kent records to 2024 mapped at tetrad level, from BSBI database.**

With an Ellenberg indicator value of 7 for light, *Ervilia sylvatica* is ranked with plants growing generally in well-lit places, but also occurring in partial shade. While this would seem to afford considerable flexibility of habitat, our Kentish data suggest that a balance of light and shade is required which may often only be afforded by temporary conditions. *Ervilia sylvatica* appears to be a woodland plant which needs light created by coppicing or other clearance, and is disadvantaged by a combination of competition from brambles or the like in response to the light and of the return of shading with tree growth. The latter may be the main disadvantage. Our recent records include having noted it scrambling through brambles, nettles, rosebay willowherb and bracken.

But there is a constant theme of association with activities bringing light into woodland, especially coppicing. We have recorded it by chestnut coppice; encouraged by formation of clearing along woodland tracks in the course of game bird management; in woodland clearance under pylon lines; by woodland track or ride margins; and at a beech plantation where thinned two years before. A corollary of this of course is that with the loss of light over time, e.g. cessation of coppicing, Wood Vetch is likely to be even more marginalised and may disappear from a locality.

Its associated flora has been noted with records from Atchester, Bursted, Covert and Fryarne Park Woods. Constant associates were *Rubus fruticosus* agg.(Bramble) and *Pteridium aquilinum* (Bracken); occasional were *Rumex sanguineus* (Wood Dock) and *Urtica dioica* (Common Nettle). Other plants were (Atchester Wood:) *Heracleum sphondylium* (Hogweed); (Bursted Wood:) *Fragaria vesca* (Wild Strawberry), *Primula vulgaris* (Primrose) and *Rosa arvensis* (Field-rose); (Covert Wood:) *Cirsium arvense* (Creeping Thistle) and *Potentilla anserina* *(*Silverweed); and (Fryarne Park Wood:) *Chamerion angustifolium* (Rosebay Willowherb), *Galeopsis* sp. (Hemp-nettle), *Lapsana communis* (Nipplewort*)*, *Sonchus oleraceus* (Smooth Sowthistle), *Torilis japonica* (Upright Hedge-parsley), and *Vicia sepium* (Bush Vetch).

Most of these species suggest a rather coarse vegetative cover; all are compatible with woodland margin locations. The general area of Wood Vetch's distribution is on chalk, generally covered by clay-with-flints or Tertiary Head deposits: none of these species is especially calcicole and Alie Gay remarks in relation to Fryarne Park, Covert and Garden/Parsonage Woods that the floral assemblage seems related to clay-with-flints rather than chalk.

When in flower, so that the delicate purple veining of the petals is apparent, *Ervilia sylvatica* is not readily capable of being confused with any other British species.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Stelling Minnis	TR14N, includes TR1547		(1) 25 July 2023 (2) 22 July 2023 (3) 29 October 2014 (4) After 1970, before 1981	(1) SB (2) SC (3) AG (4) Philp (1982)	(1) A dozen or so tiny non-flowering plants as described by A. Gay in 2014 still present by the roadside at TRc1599 4753 and still in shade. (2) Two large plants with seed pods & 6 small ones on verge at TR 15968 47550. (3) Fryarne Park Wood, TR 1596 4754, 37 plants, all vegetative, recorded along the northern bank of the road that cuts through the wood. Growing in fairly heavy shade (unusual for this species) and perilously close to the road (a couple even seemed to be growing out of the roadside mud and leaf litter at the base of the bank). All plants seen were very small. (4) TR14N.
North of Stelling Minnis	TR14P		After 1970, before 1981	Philp (1982)	TR14P
West of Bladbean	TR14T, includes TR1647		(1) 25 July 2023 (2) 6 August 2013 (3) 22 June 2006 (4) After 1970, before 1981	(1) SB (2) AG (3EGP (4) Philp (1982)	(1) Spread of fruiting plants at TR 16181 47954 under pylon lines. Several plants but impossible to tell how many. (2) Fryarne Park Wood TR 16100 47681, scattered young plants (at least 20) in pylon clearing in an area where the tall vigorous vegetation (mostly *Chamerion angustifolium*) had been recently cleared. All plants seen had probably only germinated in the previous 12 months (all were small and non-flowering) but were in danger of being-out-competed by *C. angustifolium* and *Rubus fruticosus* as they grow back. Associated species: *Rubus fruticosus*, *Chamerion angustifoliu*m, *Urtica dioica*, *Vicia sepium*, *Rumex sanguineus*, *Galeopsis* sp., *Sonchus oleraceus*, *Torilis japonica*, *Lapsana communis*. As with its other sites at Covert Wood and Parsonage/Garden Wood the associated flora is not particularly characteristic of calcareous substrates and the earth looked closer to that derived from clay-with-flints than that derived from the chalk. (3) TR14&. (4) TR14T
East of Bossingham	TR14U, includes TR1648, TR1649, TR1748		(1) 22 July 2023 (2) 10 July 2020 (3)27 June 2011 (4) 20 June 2010 (5) 1991-99 (6) 25 May 1984 (7) After 1970, before 1981	(1) SC (2) AG (3) LR (4) HS (5) EGP (6) FR (7) Philp (1982)	(1) One vegetative plant refound at TR 1757 4867. (2) Covet Wood, TR 1757 4867. In the beech plantation which holds the large *Orchis purpurea* colony. The appearance of it here has probably been stimulated by thinning of the beech trees 2 years ago (for the benefit of *O. purpurea* colony). (3) TR 16062 48152. Atchester Wood. A woodland ride near the edge, parallel to Pett Bottom Road. Six clumps (and so possibly six plants) on the north side of the track growing amongst and up through *Urtica*

					dioica, *Rubus fruticosus* agg., *Pteridium aquilinum* and *Heracleum sphondylium*. (4) Atchester Wood, TR 160 480, In an area of c. 3.5m x 2 m and having to compete with bramble, nettle and bracken. [Private woodland visited with the owner's permission.] (5) TR14U (6) TR1649, by lane, Lynsore Bottom. (7) TR14U.
East of Elham	TR14W, includes TR1942, TR1943		(1) 29 May 2015 (2) 8 May 2011 (3) 26 May 2000	(1) SB (2) AG & LS (3) JP	(1) Garden Wood MOD training area, north end of wood at TR 19429 42829. Plants spread for 5m at margin of main track in fairly well-lit area and climbing over a coppice of hazel, sweet chestnut and field maple. (2) Parsonage Wood, TR 196 432, growing in the ruts of a track on the edge of a recently coppiced area. Noted that it was not recorded from here in 1982 or 2010 atlases although JP mentions it near Hawkinge in the Kent Red Data Book [and cf. below, a Parsonage Wood record for 2000]. Given that the woodland would have been unsuitable closed canopy woodland until very recently, the seeds must be able to remain dormant for quite a long period. (3) TR 194 426, Garden and Parsonage Woods, Acrise
Bladbean	TR14Y		After 1970, before 1981	( ) Philp (1982)	TR14Y.
Covert Wood	TR14Z, includes TR1848, TR1849, TR1948		(1) 10 July 2020 (2) 26 August 2017 (3) 5 August 2017 (4) 16 June 2012 (5) 15 June 2011 (6) 10 June 2011 (7) 18 June 2004 (8) 11 June 1998 (9) 22 June 1985 (10) After 1970, before 1981	(1) AG (2) CO (3) SL & AG (4) CO (5) AG (6) JR (7) JP (8) PG & FR (9 FR & KFC meeting (10) Philp (1982)	(1) (a) Covert Wood TR 18698 48351, four sprawling patches spread along 20m of woodland ride, on southern side of the main forestry track that leads into the wood. Has now been here for at least 10 years. (b) Covert Wood (Collardshill Wood) TR 19013 48091. A fine patch beside the track on the edge of a large area of recently coppiced chestnut. (2) Patch still present at TR 187 483 as seen previously on 16 June 2012. (3) Covert Wood, southern edge of ride near entrance, TR 18676 48365, strip of plants a few metres long, crawling over *Cirsium arvense*, mostly finished flowering. (4) 3m x 2m patch in full flower along south side of track c. 50m from road at TR 187 483. Assumed by recorder to be same as 15 June 2011 record (5) TR 187 483, a fairly large patch, covering an area in excess of 2m x 1m. Habitat is not particularly chalky - it grows in a slight ditch to the side of a stony Forestry Commission track. Other spp close by are *Potentilla anserina*, *Cirsium arvense*, *Rumex sanguineus* and *Pteridium aquilinum*. Recorder is sure it wasn't here last year, but it has been recorded from the area on many occasions. (6) TR 1904 82, Covert Wood on si.de of main track - 5+ plants. (7) TR 182 485. (8) TR1848. (9) TR1849, woods south of Duskins, by roadside.

					(10) TR14Z.
Bursted Wood	TR15Q, includes TR1650		(1) 16 July 2011 (2) 17 May 2001 (3) After 1970, before 1981	(1) AG (2) JW (3) Philp (1982)	(1) Bursted Wood, midway along the pylon line at TR 162 507 - a long known population, but the healthiest recorder has seen in Kent. Abundant along a 20m stretch of pylon line; difficult to record numbers as it scrambles everywhere! *Rosa arvensis*, *Fragaria vesca*, *Pteridium aquilinum*, *Rubus fruticosus* agg. and *Primula vulgaris* all in vicinity. [Private woodland visited with the owner's permission.] (2) Bursted Wood, TR 162 505. (3) TR15Q.
Swingfield Minnis	TR24C, includes TR2044		21 July 2015	SB	A patch 1m x 1 m, climbing over bramble in chestnut coppice, Canterbury Wood at TR 20165 44879. This in an area which is managed for game birds, and therefore clearings created sporadically along the track.
Woolage	TR24J		After 1970, before 1981	( ) Philp (1982)	TR24J.
North west o Alkham	TR24L, includes TR2443		(1) 16 June 2020 (2) 11 August 2019	(1) SB (2) SB	(1) Plant seen last year in fruit at TR 24670 43820 now spreading and flowering well and with two additional small plants a few metres further up the bridleway at TR 24692 43814. (2) A large sprawling plant or plants with fruits at TR 24670 43820 alongside a bridleway in Fidges Wood. The MOD have recently repaired the ride which has opened up the banks, allowing the plants to grow.
East of Lydden	TR24M		After 1970, before 1981	Philp (1982)	TR24M.
Ringwould	TR34N, includes TR3547		11 June 1985	JP	[TR 359 473 was the given grid-reference, but this appears to be the general wood access point.] Described in SNCI designation of The Lynch and Oxney Court Woods as occurring in scrubby edges at the southern end of the woods.

Eryngium campestre L. (Field Eryngo or Watling Street Thistle)

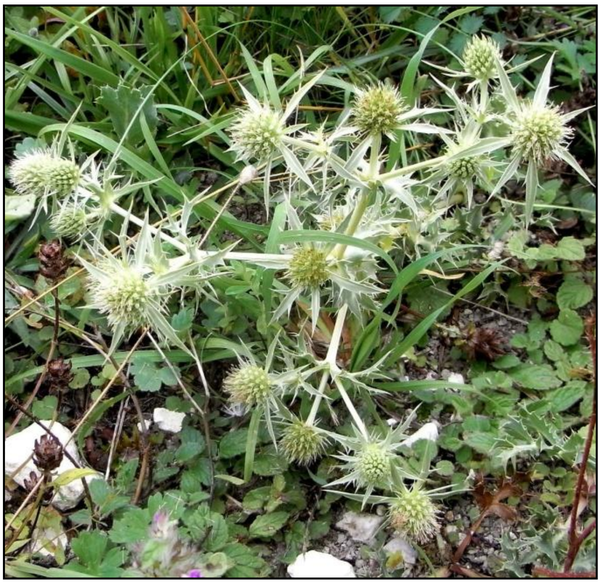
Vc 15 and 16

Rarity / scarcity status

Field Eryngo is a **nationally r**are plant, mostly present in south west England, which has formerly been assessed for Great Britain as being Critically Endangered, i.e. incurring severe risk of becoming extinct in the wild, but has since reverted to the English assessment of being **Near Threatened**, based on a low number of sites (but not low enough to qualify for a higher risk level) and continuing decline since 1930. This latter assessment did not identify a sufficient decline in area of occupancy or extent of occurrence to fulfil criteria which gave rise to the earlier Great British assessment, although to all intents the same populations were being considered. It is is included as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006 and is protected under Schedule 8 of the Wildlife and Countryside Act 1981. There are only three locations for this species in Kent, and so it is **rare**.

Account

The origins of *Eryngium campestre* in Kent are somewhat mysterious, given that one would expect such a distinctive plant to have been noticed early, at least if it were flourishing. However, the first publication of this species for Kent is as late as H.C. Watson's *Topographical Botany* (1873), which simply refers to F.J. Hanbury. This must relate to Hanbury's find described in Hanbury & Marshall (1899) as previously being "On the Warren between Romney and Dymchurch, near the targets, some way from the sea; growing in sand, associated with *Ammophila arundinacea*". Although still present in 1880, it could not be found in 1892, following alterations to the ground. Hanbury and Marshall, discounting an unconfirmed record at Cobham, were obliged to consider the species not just very rare in Kent, but apparently lost. They pointed out – as have other botanists since – that it is plentiful about Calais, and there was no reason to doubt it having been native at Romney.



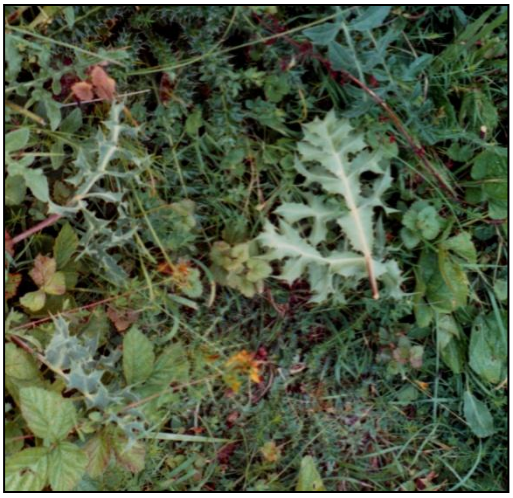
Darenth. Photo by Mervyn Brown, 24 August 2011

Taking Britain as a whole, populations at Devon have been hailed as native, and most other populations considered likely to have been introduced; but currently the species is regarded as an archaeophyte, or ancient introduction, in Britain, both as regards Devon and all other colonies. This status is probably not a fully resolved issue and is considered further at the end of this account.

Since its disappearance from Romney, *Eryngium campestre* has been seen at four sites in Kent, only three of which are known still to survive. All are, or were, related to the chalk of the North Downs, including its dip slope towards the Thames. The lost site was, according to Francis Rose, towards the top of the North Downs, one mile north of Wrotham (TQ 605 597, per R.A. Graham). It was seen up to 1947 at least from 1922 ("a good patch on the open chalk down", "in July 1930...a nearly circular patch of about five yards in diameter", G.C. Druce). J.E. Lousley commented in 1934 that it was looking native. Although long unrecorded, it was searched for here in 2012, but without success.

The other sites are also on chalk grassland. It was found at Darenth by H.M. Pratt in the grounds of Darenth Park Hospital, an institution for learning disabilities, where he then lived. One source gives 1950 for this discovery, but from Mr Pratt's papers at Dartford Library, it was on 8 July 1968 and was found on chalk ground disturbed after the Lower Southern Hospital was demolished, adjacent to the entrance road where a gas main lay, and originally extending over an area of no more than two square metres. The seed-bank for this area has provided evidence of an arable past. It seems likely that the immediate disturbance was the bulldozing of the area, with rubble being heaped not far from the plant's site, together with the removal of a boundary fence, whose concrete anchoring currently adjoins the *Eryngium*.

The number of plants (or more probably, ramets from the same clone) has varied over the years, and their centre has migrated about a metre southwards. The rhizomes are very deep and occur within the undisturbed chalk rendzina, which is overlain by about 20cm of tertiary deposits – medium particle sized sand with a little clay. The patch was circular, at least from the 1970s, but limited to the north by a tarmacadam road, so that in the course of management of its surroundings by Mervyn Brown on behalf of the health authorities from 1979 to 1988, when the hospital closed, the patch expanded away from the road to cover 15 to 20 square metres, producing at maximum five flowering plants per annum. This management continued until the site was taken over by Dartford Borough Council and developed, as a National Millenium project so as to become a country park. In the course of this development, the tarmacadam road was removed, with serious consequences for the *Eryngium*. It appears that the road had deterred rabbits approaching from the north and provided a water reservoir underneath for dry years, accessible to the deep roots of the *Eryngium*, as well as warming the soil (because of the black surface), which is beneficial to the species' successful growth. The removal led to an explosion in vegetation and a vast increase in rabbit numbers around the plants. The rabbits dug for the roots, ate young leaves and severed mature leaves, eating only a small part of the petiole.



Darenth. Leaf severed by rabbit grazing. Photo by Mervyn Brown, 1990s

Darenth, habitat. Photo by Geoffrey Kitchener, May 2012

From 1997, numbers of plants declined until in 2009, when Mervyn Brown revisited, scrub levels were found to be too high and the *Eryngium* could not be seen. He arranged a joint inspection by Natural England, when a single juvenile leaf of about 12 square cm was located, at some distance from the previous centre of clonal strength. He drew up a recovery plan, adopted by Dartford Borough Council and approved by Natural England. Scrub clearance was undertaken and open wire fencing installed which is intended to deter rabbits by virtue of rendering them easier prey for foxes. After four kills by foxes, rabbits rarely entered the area and seem to have learnt to avoid it. By 2012, the *Eryngium* had been restored to a state in which ramets were visible over an area of 8 to 12 square metres within a developing favourable grass composition of *Festuca rubra* (Red Fescue) and *Agrostis stolonifera* (Creeping Bent). This restored state (about 250 ramets by 2015) largely represented growth from the remains of rhizomes whose growth had been suppressed by scrub and rabbits: only four new ramets had been detected and several weaker ramets had failed.

The Princes Park colony was discovered by Martin Hall, at the beginning of the 1990s, on grassy banks (predominately *Bromopsis erectus*, Upright Brome) on chalk, maintained as public open space by Medway Unitary Authority. Its appearance followed the construction of a footpath cut into the slope using earth moving machinery. Three plants occurred in two separate locations some 10 metres apart, flowering in some years but not in others. The plant most remote from the path has since disappeared at least from above ground and was last seen in the late 1990s. The remainder also disappeared shortly after 2000, in the absence of specific management measures. A single flowering plant was discovered in 2009 by Mervyn Brown with Simon Bellinger, who was the ranger for the site at that time. The site had been affected by a grass fire the previous year, recreating a ruderal site. Careful searching of the nearby grassland unaffected by the fire revealed continued presence of the species, dormant under the vegetation. Management was initiated and the clone improved, although erratically in some parts. It is mown where the clone impinges on the path and the pressures of public access generated by the large adjacent housing estate cause some problems, although the species (at least from its French habitats) appears tolerant of a degree of disturbance.

Princes Park, habitat. Photo by Mervyn Brown, 24 August 2011

Bredhurst, habitat. Photo by Lliam Rooney, 2013

The occurrence of *Eryngium campestre* at Bredhurst has been written up in 1984 by Joyce Pitt.[212], who observed the colony in most years since the early 1970s, following its discovery by Nora Miller in 1969. She described it as located on the south-facing slope of a dry chalk grassland valley, where the steep slope begins to flatten out at the crest of the down. The chalk is nodular and so admits root penetration. Plant numbers then generally fluctuated between 10 and 30, although 50 were counted in 1983. Flowering was only occasional, not least because it was usually cut down during haymaking. The general area was one of chalk grassland flora, including *Poterium sanguisorba* (Salad Burnet), *Plantago media* (Hoary Plantain) and *Primula veris* (Cowslip), but stated to have been affected by 'improvement' in the 1960s. This raises the possibility of introduction if the location had been re-seeded with a contaminated grass-seed mixture of continental origin, as may have been an origin of Cornish populations[213]. Joyce Pitt noted that the area where the plant grows was then somewhat different, being disturbed and broken, partly due to rabbits, but also perhaps due to agricultural use, whether by animals or machinery. At some stage in the 1980s it appears that the field was ploughed about 8 inches deep and drilled for a crop of barley, with the intention of again laying to grass afterwards; and the plant survived this disturbance. It also seems possible to interpret the field slope as showing more signs of an arable past in the upper parts, where the *Eryngium* grows, than the lower parts, which carry a chalk flora more consistent with grazing.

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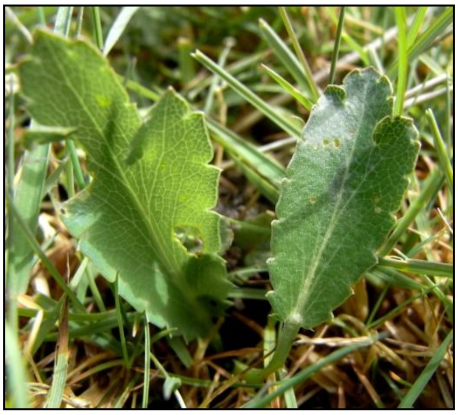
[212] J. Pitt. Habitat notes on Watling Street Thistle (Eryngium campestre) near Bredhurst, Kent. *Bulletin of the Kent Field Club* (1984) 29: 30-31.

[213] According to D. Junghanns and M.J. Wiggington in their account, *Eryngium campestre* L. (Apiaceae), in (ed. M.J. Wiggington) *British Red Data Books 1 Vascular Plants* (1999), JNCC. This view was based on the plant having been found after pasture was re-seeded, rather than on any separate evidence that *Eryngium campestre* is known as a grass seed contaminant. The late maturation of *Eryngium campestre* seed in comparison with that of grasses militates against it being a normal contaminant.

The current Kent colonies each comprise a coherent patch (Darenth is semi-circular, Princes Park is selectively radial and Bredhurst is circular) consisting of what appear to be separate, but associated plants which do not recruit from seedlings. Indeed, they seldom flower. Mervyn Brown, who had long studied the Kent populations, gave data for their size and flowering as follows:

- Darenth: 90 to 100 plants with 4 flowered in 2011; 80 to 100 plants with none flowered in 2012
- Princes Park: 120 to 150 plants with 1 flowered in 2011; 140 to 150 plants with none flowered in 2012
- Bredhurst: c.500 plants with 55 flowered in 2011; over 700 plants with 20 flowered in 2012.

It is reasonable to conclude that each of these colonies represents a single clone, where the associated individuals are ramets, deriving from vegetative spread and perhaps continuing plant growth which might otherwise cease with senescence of upper roots. The average clonal spread, in the absence of checks, appears to be 8 to 10 cm per annum, from Mervyn Brown's observations. He considered that the plant expands radially, but seemingly may cease to expand in a direction where a problem is encountered or otherwise may expand away from unsuitable areas. It could be, however, that the apparent cessation of expansion is represented by unseen underground growth, which may appear later at some distance from the nearest ramet. The management implications are for surrounding terrain to be maintained in a suitable condition for clonal expansion. Discouragement of coarse grasses assists in this and also reduces habitat which capable of harbouring slugs and snails which might otherwise graze on early young shoots, so retarding growth.



Bredhurst. Juvenile leaf of ramet, beginning to show first insection. Flowering does not take place before five insections have developed on each side of the leaf, reaching the central vein.
Photo by Mervyn Brown, 21 April 2011

Mervyn Brown found that the species in cultivation grows rampantly in free-draining soil and is capable of reproducing from seed from his Kent garden, albeit virtually only in pots subject to very specific germination requirements, of which constant moisture is one and warmth (preferably 15°-20°C) is another. Garden seed fails to germinate if placed in habitats comparable with its Kent wild localities. Also, no seedlings have been observed with the Kent wild plants, even where seed is known to have fallen. Failure to reproduce by seed in the wild does not seem to be an issue of viability. It seems as though the Kent localities and their local climate are sub-optimal for the species, and conservation measures are unlikely to achieve anything more than vegetative spread of existing plants.

The different wild plants demonstrate differing relative vigour. This relative vigour has been assessed by Mervyn Brown (for 2011) so that the Darenth and Princes Park colonies may be regarded as exhibiting 4% and 10% respectively of the vigour shown by the Bredhurst colony. Vigour is taken as a function of healthy rootstock. It may be demonstrated by factors such as the extent of flowering, the number of heads per flowering stalk and the diameter at the base of the stem, but is measured by the total leaf area index (relating total leaf area to the ground area occupied) of a colony at the beginning of July. The relative vigour for 2015 was taken to be for Darenth and Princes Park 15% and 5% in relation to the 100% of Bredhurst, so the Darenth colony appears still to be improving, both relative to Bredhurst and in absolute terms. Its spread as at 2015 was in excess of 20 metre squared and the leaf area index was about 0.1 (ranging from 0.4 to less than 0.01); the total leaf area was 2 metre squared with 9 flowering plants and an estimated ramet count of 250. For a healthy colony, land management is considered to be the overriding factor with climate as secondary; predation and competition appear to be the two main negative factors.

It is possible that there is a genetic difference between East and West Kent plants. The shapes of leaf and capitule of the Darenth colony differ from those of the Bredhurst and Princes Park colonies, Darenth resembling some plants from Spain and southern France, Bredhurst and Princes Park resembling continental mainland plants nearer the English Channel. In considering differences in vigour, however, there is also the recent history of the colonies' relationship with their individual environments to be taken into account, in so far as this is understood.

It appears that the species responds to a degree of disturbance[214], which may be associated with an appropriate (but not excessive) grazing or simulated grazing regime, without which a colony will decline, the plants becoming dormant. Failing vigour, tending to dormancy, is shown by the petiole length declining for a colony, year on year, until any grass cover swamps the plant. This dormancy has been observed at all three sites in Kent at different times. It seems to entail the decay of the upper root system through attack by pathogenic fungi. If this decay is sufficiently extensive, it may be that dormancy could only be broken by disruption to the root system, e.g. removal of topsoil or the slicing of deeper roots. The sites at Darenth and Princes Park are recovering from dormancy and near-extinction around 2009, and as yet remain fragile. However, appropriate management strengthened both clones, although it is estimated that five to ten years are required for recovery of a colony weakening towards extinction, so that the rootstock has developed sufficient resistance to fungal attack. The site at Bredhurst, although sometimes erratic in performance, is increasing in strength with the current management by the site owner.

Although the species is currently regarded as an archaeophyte (brought to Britain by man, intentionally or unintentionally) and naturalised between the start of the Neolithic period (*c.* 4000 BC) and AD 1500), this is not a status readily capable of proof. The absence of British fossil record is perhaps a pointer, but by no means conclusive, especially as the pollen of Field Eryngo is viscid, rather than wind-borne, and so less likely to be deposited widely. If it were to be treated as native in Britain (which was generally the norm until 1985[215]), then Kent has the best geographic credentials, Francis Rose stating (c. 1980) that it is "very common on sand dunes...west of Calais, and on the chalk inland from Cap Nez Blanc, so probably native in Kent, it is only surprising that it is so rare with us"[216].

The strength of the case for regarding Kent as a native area, as part of a distribution which includes the European mainland, appears somewhat weakened by the lack of ancient record and the reluctance of plants to reproduce by seed. (Seed spread would need to be identified by the presence of cotyledons on seedlings, which would otherwise closely resemble small plants emerging from shoots from the deep rhizomes.) However, if each occurrence has been an introduction, there does not seem to be a single explanation which covers all of these. Any suggestion that they have come from travellers from northern France is perhaps unduly influenced by the name Watling Street Thistle (which derives from a Northamptonshire occurrence, rather than the road in Kent); and the known Kent sites, other than at Darenth, are not all particularly near the historic Watling Street route. Whilst the possibility is mentioned above of re-seeding having introduced the Bredhurst clone, it would have been entirely possible for its existence to have preceded this event and for the clone, being deep-rooted, to have survived the associated ploughing as it did in the 1980s. The Darenth clone has been associated with ground disturbed by works, but it cannot necessarily be inferred that it was introduced as part of the disturbance. Similarly, the Princes Park clone came to light following footpath works. So all three current clones have a common background of site disturbance and, given the absence of any known seed-bank and the reluctance of the species to germinate seed in 'wild' Kent conditions, it could be maintained that their discovery was a consequence of the revival of dormant clones through disturbance, rather than any recent introduction.

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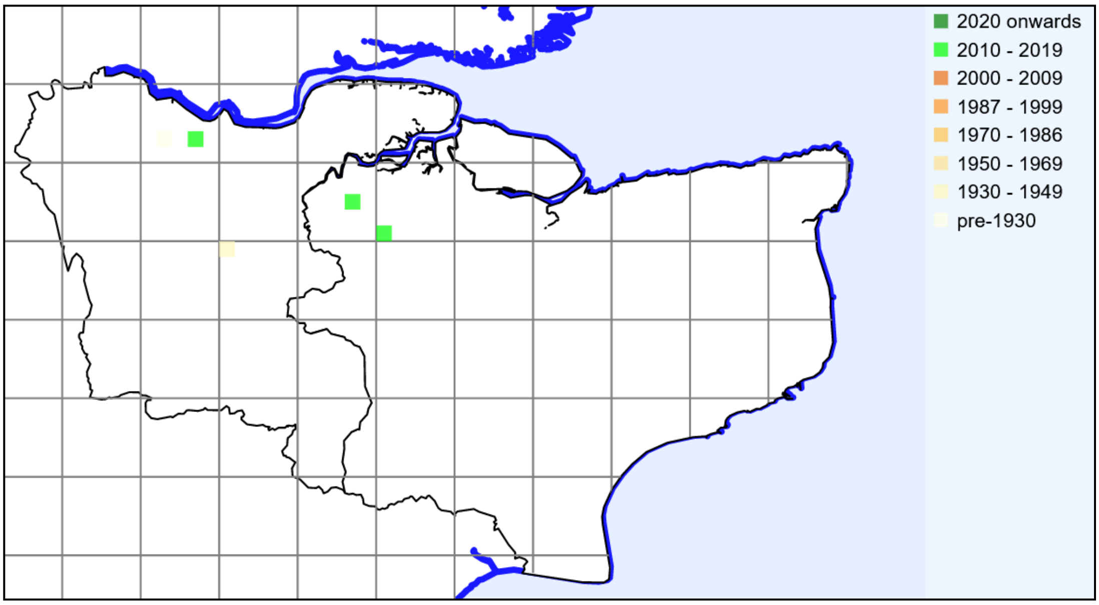
[214] The accounts of each Kent colony given above include various disturbance events, not all of which have been by any means destructive to the plants, which may be rejuvenated by ruderalization. Re-sprouting after cutting back is recognized more widely. E. Masson Phillips reported this in relation to a colony at Plymouth cut back to the roots in 1935, but growing as strongly as before in 1936 (*BEC Report for 1936*, p.257).

[215] Status was re-assessed by D.A. Webb (1985), What are the criteria for presuming native status? *Watsoni*a **15:** 231-236. This account, however, does not adduce any new evidence.

[216] Unpublished remarks, quoted by Rosemary FitzGerald (1987) Eryngium Campestre L. Field Eryngo (The 'Watling Street Thistle'), unpublished NCC report.

Mervyn Brown postulated that the Kentish relationship with the species' European distribution is an ancient one, which precedes the discontinuance of the land bridge between Britain and continental Europe *c*. 6500 BC; and that some or all of the Kent occurrences could represent continuous clonal growth from before then. Clonal growth in other species has of course been recognised as feasible over tens of thousands of years; and survival need be no more surprising than the persistence in the Kent Weald of *Trichomanes speciosum* (Killarney Fern) gametophytes (discovered in 2016) since an era of very different climate conditions. The reluctance of the Kent plants to set seed in the wild would then not necessarily be an impediment to inferring native status, but could be a reflection of the suitability of their locations on original establishment having declined since that establishment. This may perhaps be due to climate changes over this lengthy period, although established plants are still capable of sustaining growth both in the wild and in garden conditions[217]. However, this hypothesis does rely upon habitat remaining suitable for survival over a very long period, against a background of relatively recent losses and near failures, and it would appear that survival will have been something of a matter of chance. The status of *Eryngium campestre* accordingly remains intriguing.

***Eryngium campestre* Kent records to 2024 mapped at tetrad level, from BSBI database.**



The following records represent a series of sightings by various botanists since 1970, but only include a sample of observations by Mervyn Brown, others of which have gone towards the summaries of clonal development set out above.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Darenth	TQ5672	Darenth Country Park, managed by Dartford Borough Council	(1) 27 September 2019 (2) 22 July 2017 (3) 23 April 2015 (4) 29 May 2012 (5) 1992 (6) 21 Aug 1985	(1) & (2) RR (3) MB (4) GK (5) MB (6) RF (7) EGP	(1) TQ568725, non-flowering, from leaves there appeared to be about a dozen ramets. (2) Flowering, TQ 56793 72493. (3) 240 ramets, some emerging from an area where root presence was weak.

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[217] Germination may be supposed to have been favoured by a climate with warmer springs than at present. In relation to the current Kent sites, it would also have been assisted by damper springtime conditions, with increased water flow through the (now) dry valleys on the chalk downs. At present, Bredhurst is the only site with any damp indicators, the presence of *Ajuga reptans* (Bugle) being suggestive. The importance of high water potential for satisfactory germination of *E. campestre* is noted, in a Spanish context, by E. Bochet et al. (2007), Soil water availability effects on seed germination account for species segregation in semiarid roadslopes, *Plant Soil* **295**: 179-191. From this paper, it appears that *E. campestre* is also slow to germinate and this slowness increases with decreasing water availability. This would be compatible with a plant strategy which allocates resources to energy storage at the cost of seed production, seedling survival and growth rates; the payback for which is the ability to re-sprout as an established adult, resisting soil surface aridity and persisting continuously after disturbance.

			(7) 1973		(4) Patch 5m x 2m (MB assesses as c. 5m x 3m) from TQ 56793 72491 to TQ 56898 72493, chalky ground (possibly disturbed by former uses of the site) maintained open. No sign of potential flowering. (5) TQ 568 724. Just one ramet flowered this year and a small collection made for the Millennium Seed Bank. (6) TQ 568 724. At least 30 ramets in rough grass in clearing between thorn bushes at Darenth Hospital. Ground previously disturbed, but chalk grassland flora re-establishing. (7) TQ 568 724. Plenty at Darenth Hospital but not in flower.
Princes Park, Chatham	TQ7665	Public open space managed by Medway UA	(1) 17 August 2011 (2) 1993	(1) SP & DG (2) SP, DC & EGP	(1) TQ 76835 65221, Princes Park, on banks, beside footpath, spread over 2 sq metres. (2) Recorded as TQ76S.
Bredhurst	TQ8061	CROW access land	(1) 2 July 2015 (2) 28 May 2012 (3) 8 May 2011 (4) 1985 (5) 15 November 1975	(1) DS (2) SL (3) KFC meeting (4)RF (5) GPS	(1) TQ 80578 61890, half square metre patch, hundreds of flower heads but only two flowering. (2) *T*op of the field edge at TQ 80565 61894, appearing to be a large clone, comprising small interconnected patches of plants, spread thinly over an area of about 6m x 6m, where they co-exist with other species without dominating. (3) TQ 805 618, Patch about 3 metres in diameter along top edge of field. (But measured as 6 metres in diameter that year by MB, who considered that the colony had benefited from grass suppression through off-road motor cycling.) (4) TQ 805 618 (5) A good patch growing in an old meadow.

Eryngium maritimum L. (Sea-holly)

vc 15 and 16

Rarity / scarcity status

Sea-holly grew widely around the coasts of the British Isles and, although it has largely gone from north and east Scotland as well as north east England, its conservation status in Great Britain as a whole has been one of 'Least Concern'. However, in England there is some evidence of decline such that it is considered to be **Near Threatened**. This risk assessment is based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 28% and its area of occupancy had declined so that there was a 30% reduction in the likelihood of recording the species. In Kent, it is neither rare nor particularly scarce, but appears to be countering the wider trend by increasing its range by 67% between 1971-80 and 1991-2005. It is a Kent axiophyte, indicative of good habitat.

Sandwich Bay, in light grassland. Photo by David Steere, 11 July 2013

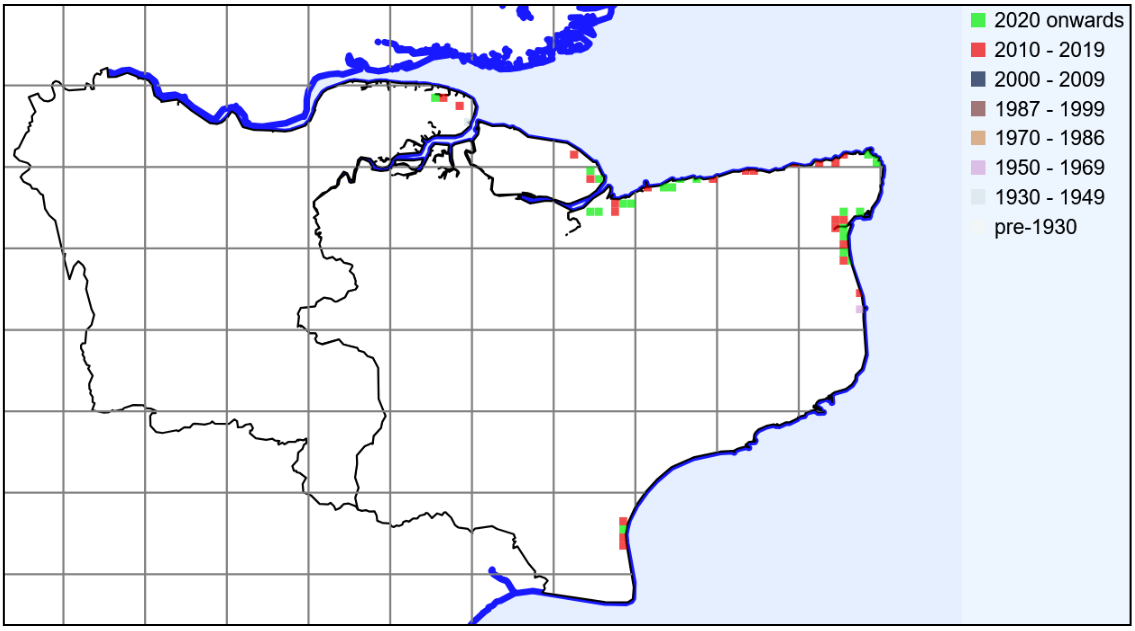
Account

Sea-holly was first recorded in Kent by John Gerard in his *Herball* (1597), who states that '*Eryngium marinum* growth by the sea side upon the baich and stonie ground; I found it growing plentifully at Whitstable in Kent' (where it is still present, although not plentiful). There is a good range of historic records, ranging from Grain (by B.D. Jackson, before 1899); Sheppey (by Thomas Johnson, 1629, at Queenborough, where the Mayor summoned Johnson and his party to account for their presence); along the north coast, e.g. between Graveney Wall Sluice and Seasalter, where seen by the Rev. John Bateman (d.1700) and at Westgate Bay where recorded by Thomas Johnson in 1632; and around Thanet where, on the beach at Margate, the Rev. Robert Hunter listed it in a catalogue of plants in his *Short Description of the Isle of Thanet* (1796). Further round the east coast, its presence was published by G. E. Smith in 1829 as among sand by the roadside between Pegwell and Sandwich, and also on the shore at Dymchurch; and at least one of the joint authors of Hanbury & Marshall (1899) saw it at New Romney – their assessment of its county status was 'frequent'.

Reculver, on shingle. Photo by David Steere, 1 August 2015

Philp (1982), however, regarded *Eryngium maritimum* as growing in good quantity only in the Sandwich Bay area and on the north beach at Grain. Elsewhere (west Sheppey, Graveney, Ramsgate, Greatstone) it was only really just hanging on, and the total number of tetrads within which it was recorded during 1971-80 was 12. However, this total had increased to 20 by 1991-2005, and Philp (2010) commented that the species appeared to be doing well and was more widespread and numerous than ever recorded before. The reasons for this are unclear, but it appears to be a continuing trend. The 2010-24 distribution map shows 44 monad records, which are the equivalent of 30 tetrads (an increase of 150% over the 1971-80 position), with fresh sites along the north coast from Herne Bay to eastern Thanet. It is unlikely that the trend is an artificial product of recording sampling. *Eryngium maritimum* has probably always been well recorded, as a conspicuous plant in a generally accessible habitat.

Eryngium maritimum **Kent records to 2024 mapped at monad level, from BSBI database.**



In Kent, Sea-holly is found only as a coastal plant. It has been noted on sand dunes, sandy beaches, shingle, grassland/shingle and a few plants have been seen on the concrete apron of the former hoverport at Pegwell Bay. A number of sightings are of the odd plant or two, which may suggest incipient colonisation. There remain large populations at Grain (an area of 350 x 30m sandy beach was noted in 2010 as being almost completely covered) and Sandwich, where it has long been abundant on the fixed dunes between the golf course and beach. In this latter location, it often grows in close association with broomrape, which led to it being mentioned in Philp (1982) as host to *Orobanche amethystea* (Sea-holly Broomrape), regarded as new to Britain here. The status of this broomrape population was discussed by Rumsey & Jury (1991)[218], who considered that some plants approached *O. amethystea* in some respects, but that there was a full range of intermediates through to typical *Orobanche minor* (Common Broomrape) to which species the plant was referable, and the population as a whole consisted of plants parasitic on a wide range of species, not just Sea-holly. Subsequently, however, the population was regarded as sufficiently distinct in morphology and ecology, to be named as *O. minor* var. *pseudoamethystea*.[219]

Sandwich Bay. Photo by David Steere, 11 July 2013

Eryngium maritimum is a perennial with a strong tap-root, enabling penetration and anchoring in its sand or shingle substrate. The seeds are capable of spread by water, and this may be the origin of the occasional odd plant found just above the strandline. Further spread may be achieved by the plant acting as a tumbleweed in autumn/winter.

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[218] Rumsey, F.J. & Jury, S.L. (1991). An account of *Orobanche* L. in Britain and Ireland. *Watsonia* **18**: 257-295.

[219] Thorogood, C.J. & Rumsey, F. (2020). An account of Common Broomrape *Orobanche minor* (Orobanchaceae) in the British Isles. *British & Irish Botany* **2**: 223-239.

Erysimum cheiranthoides L. (Treacle-mustard)

vc 15and 16

Rarity / scarcity status

Erysimum cheiranthoides is an archaeophyte, or ancient introduction, scattered across the British Isles, but mostly in southern and central England. Despite a degree of general decline, its conservation status in Great Britain has been one of 'Least Concern'. However, in England there is some evidence of decline, and it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 22% in the likelihood of recording the species. In Kent, the decline has been much more dramatic, with tetrad records falling by 73% between the surveys of 1971-1980 and 1991-2005. Whilst the species is not necessarily scarce in Kent, if the county decline were replicated in national terms, this decline would have resulted in a much higher risk rating.

Account

The first Kent record for Treacle-mustard is given by Hanbury & Marshall (1899) as at Gravesend, and is said to have been mentioned by Robert Pocock in p.217 of his *Natural History of Kent* (1809). No such publication was ever issued, however, and the reference in N.D. Simpson's *Bibliographical Index of the British Flora* (1960) to a manuscript of that date is noted as something which had not been checked. It would appear, however, that there has been some confusion and the page reference actually belongs to a publication by George Arnold[220]. At p.217 of Arnold's work, there is an account of a botanical manuscript by Pocock dated 1821 which includes a list of rare plants found in the vicinity of Gravesend, concluding on p.219 with mention of *Erysimum cheiranthoide*s 'In Mr. Pete's[221] garden, November 5th, 1824' (sic). The date is presumably accounted for by an addition to the 1821 manuscript (the original of which is held by Gravesend Library); and the garden is probably that of Dr. William Peete, a botanist of Dartford, which raises the possibility that, even if the plant was growing 'wild' there, it may have been introduced by Dr. Peete for botanical interest.

Oxney. Photo by Sue Buckingham, 29 August 2014

In view of the ambiguity of the first record's status, it may be worth mentioning the next record — members from the Botanical Society of London in 1839, 'about the middle of the Sandy Hill leading from Woolwich to Plumstead Common… found in the hedge-banks on the left a small plot of *Erysimum Cheiranthoides,* a plant whose foliage and flowers rival each other in elegance'[222]. These references aside, Hanbury and Marshall cited no printed sources, but gave a scattering of records from contributors to their *Flora of Kent* across the county, and referred to the species as a rather rare colonist, growing on cultivated and waste ground, chiefly on a sandy soil. The lack of early printed record for the county is unusual in the context of archaeophyte arable weeds, where the normal position would be early recognition of abundance, followed by a twentieth century decline with changing agricultural methods.

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[220] George M. Arnold (1883). *Robert Pocock, the Gravesend historian, naturalist, antiquarian, botanist, and printer.* Thanks are due to Malcolm Jennings and Pauline Heathcote for helping to unravel the position.

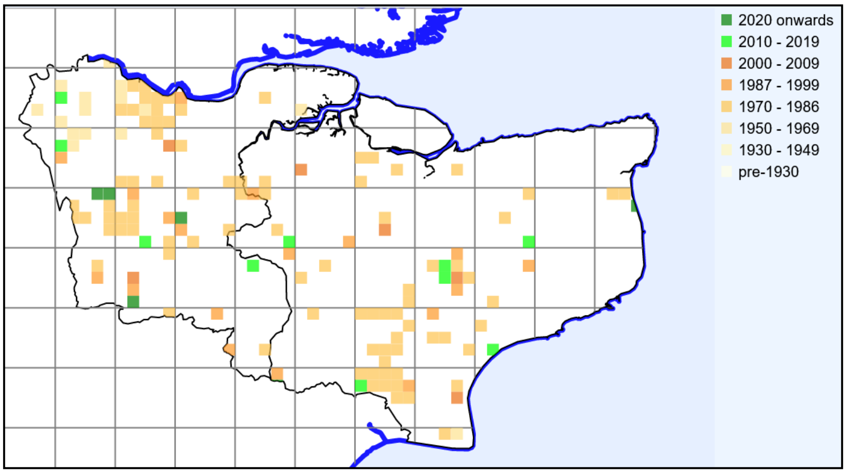
[221] 'Pett's' in the original manuscript.

[222] *Proceedings of the Botanical Society of London* (1839): 84.

Despite Treacle-mustard being 'rather rare' in 1899, Philp (1982) gave it in 100 tetrads across the county for the 1971-80 survey, quite local, but often common where found. Records were fuller in the north west and south east of the county, but otherwise were widely scattered. By the 1991-2005 survey published in Philp (2010), the total had reduced to 27 tetrads, without any discernible pattern, although lacking from the north east. It was then said to be a plant of cultivated and waste ground, particularly arable fields, and appeared to have declined in recent years, probably through changes in farming practices. Rich (1991)[223] mentions its susceptibility to herbicides, and these may have a role in the decline, especially if more effective herbicides or more substantial dosages were being used in the 1980/90s than in the 1960s/70s (cf. herbicide data given in the register account for *Spergula arvensis*).

Wye. Photo by Geoffrey Kitchener, 13 January 2016

It continue to decline, with find in only 16 tetrads (18 monads) made in 2010-24, and the following distribution map makes clear how widespread are the losses. very little is being seen of *Erysimum cheiranthoides* in the county at all, which suggests that the decline is continuing. Recent sites have included arable, a rubbish tip on a golf course, a road verge, soil from ditch clearance adjoining arable, a broad bean field, allotments or similar land and the weedy margin of a *Chenopodium quinoa* crop.



Erysimum cheiranthoides **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Treacle-mustard is, at least as regards the subspecies considered to be usually present in Britain, an annual and is capable of forming a seed bank which may result in local persistence. Normal flowering is from May to November, but the mild winter of 2015-16 demonstrated an ability to flower and fruit on young plants into January (see photographs at Wye}.

Wye, habitat. Photo by Geoffrey Kitchener, 13 January 2016.

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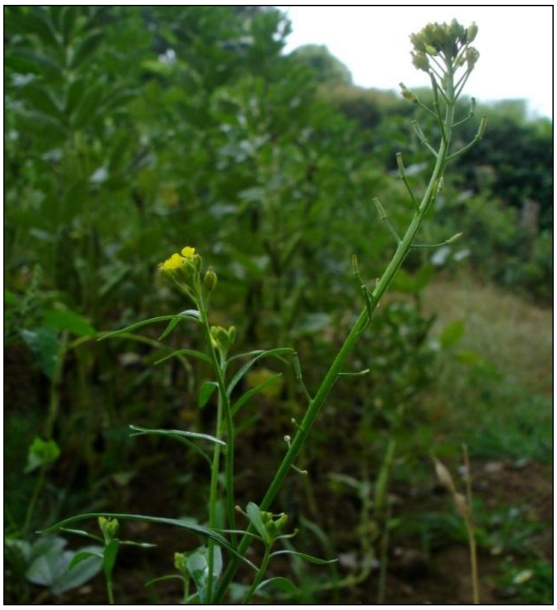
[223] T.C.G. Rich (1991). *Crucifers of Great Britain and Ireland*. Botanical Society of the British Isles, London.

The narrow, entire leaves, the small yellow flowers and the presence of hairs on the plant which are rough to touch should together distinguish Treacle-mustard from other crucifers.



Barham. Photo by Colin Osborne, 13 July 2015.

Euphorbia cyparissias L. (Cypress Spurge)

vc 15 (introduced and possibly native) and vc 16 (introduced)

Rarity / scarcity status

Cypress Spurge is included in the rare plant register by virtue of its potentially native status in East Kent, although this status is not a generally accepted position. It is currently treated as a neophyte, or introduced plant in the British Isles, where it is widespread and generally an obvious garden escape, but it is acknowledged as 'Possibly native in chalk grassland in East Kent and perhaps elsewhere in SE Eng[land]'[224] and 'sometimes regarded as a native of chalk grassland in S.E. England'[225]. Because it is labelled as a neophyte, it enjoys no conservation standing. In Kent, it is **scarce**, but its potential native occurrences are to a degree obscured by introductions. Its site at Whinlees Down, Dover has the best claim to native status and is probably the finest population in the British Isles[226].

Account

As a potentially native plant, its first Kent records were made by Eyre de Crespigny, who collected material where plentiful on a chalky hill-slope near Dover in 1876 (specimen noted by Hanbury & Marshall, 1899, and now in Cambridge University Herbarium). He elaborated on this in the *Botanical Exchange Club Report for 1879*, from which it appears that the plant was on the slope of the hill under Diggle's Tower, Dover, 'plenty and to all appearances wild'. Diggle's Tower was also known as Diggle's Folly, situated at TR3006 4160, and the general area is Whinlees Down, where it is still present (2011). Hanbury & Marshall (1899) also record correspondence from Sydney Webb of Dover, who thought that there must be localities other than Diggle's Hill, as he saw the same plant in children's garlands on May-Day, presumably in circumstances which suggested that it was gathered elsewhere.

Whinless Downs. Photo by Paul Sampson, 22 April 2009

Other early records (Sydenham, 1859 and near Penshurst, before 1899) were not credited as native. However, the Dover occurrence was treated by Hanbury & Marshall (1899) as perhaps indigenous, on the basis that the Continental distribution of the species rather favoured this. Cypress Spurge is frequent in continental Europe up to, but not within 20 miles of, the Channel coast and its growth in dry, chalky situations in Normandy and elsewhere mirrors the Dover occurrence.

Francis Rose's manuscript *Flora of Kent* listed five East Kent sites of a status to support an assessment of being almost certainly native in East Kent. These were at Whinlees Down, Langdon Barracks (east Dover), Gravel Castle (Barham), Juliberry Downs (Chilham) and Down Wood (Chilham). There was also an unconfirmed record from near Acrise in the 1950s. Philp (2010) added that its presence on the chalk at Darland Banks also looked convincing, although this is some distance from the other Dover- and Chilham-based records. *Euphorbia cyparissias* is rhizomatous and persistent, so one would expect continuity from these locations, but the Gravel Castle site was destroyed by A2-related works around 1949 and there do not seem to be recent records from Chilham (first recorded in 1932 and seen by Francis Rose, 1945-59). Philp (2010) lists Darland Banks and two tetrads for Dover, with garden escapes at two other East Kent locations.

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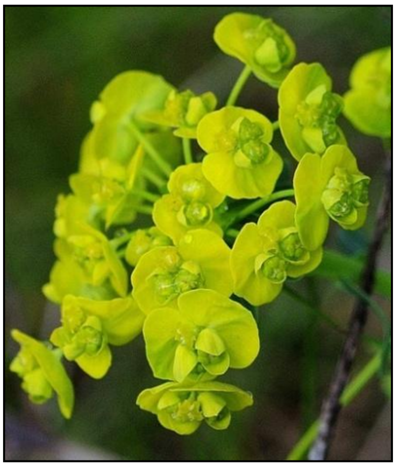
[224] C.A. Stace (2010). *New Flora of the British Isles,* third edition.

[225] (eds.) C.D. Preston, D.A. Pearman & T.D. Dines (2002). *New Atlas of the British & Irish Flora*.

[226] Assessment by Rosemary FitzGerald in manuscript notes of May 1987 which include much information that has been drawn on for this account.

The generous growth of *Euphorbia cyparissias* renders it all too 'easy' a garden plant. Garden catalogue descriptions such as 'ground-cover' or 'vigorously spreading' suggest that one should read between the lines – 'can run amok if left unattended' is probably fairer warning, and indicates how the scatter of roadside throw-out records may have arisen. The rhizomes tend to break up with their adventitious buds, each a source of fresh growth, when disturbed. There will have been plenty of opportunities for escape, as the species has been in cultivation in the British Isles at least since 1640, when John Parkinson (in his *Theatrum Botanicum*) stated that it occurred 'no where naturall in England that I can heare, but in the gardens of those that are lovers of plants...often-times found in the Country gardens of poore folkes in many places with us'.



Littlestone, an escape.
Photo by Lliam Rooney, 17 April 2012

Parkinson's assessment was accordingly against the species being of native status in England; and a species being first recorded in gardens before it is recorded in the wild is one of the criteria used in the *New Atlas of the British & Irish Flora* for identifying plants as non-native, as described by David Pearman (2007)[227]. Indeed, this point (against a background of disagreement between previous authorities) is perhaps the most persuasive one here, together with the evidence of Cypress Spurge's scattered and increasing British distribution, which is suggestive of a series of introductions. There can be little doubt that in general it is an introduced species in the British Isles, although this should not necessarily mean that every population is introduced, as Pearman then infers. It is questionable that potentially native status within a small area should be ruled out by an assertion that local Flora writers do not stand back and look at the national or European position (Francis Rose had this wider view all the time), and that amongst optimists, Marshall and Francis Rose head the list of consistent pleaders for native status for favoured species (nothing wrong with this where they could justify).

Whinlees Downs. Photo by Lady Rosemary FitzGerald, 5 May 1987

However, as much as one can say is that the Dover *Euphorbia cyparissias* is reasonably related to its continental European distribution in terms of geography and habitat; it is at least a fairly long-established population; and it looks as native as the rest of the good native flora which accompanies it.

At Whinlees Down, it occurs in large quantity on the south-facing slope at the Dover end of the Down. The Down is used for recreational walking and is *Bromopsis erecta* grassland, with a fine chalk flora. Associated species listed by Joyce Pitt in 1987 comprised *Avenula pratensis* (Meadow Oat-grass), *Bromopsis erecta* (Upright Brome), *Carex flacca* (Glaucus Sedge), *Cirsium acaule* (Dwarf Thistle), *Centaurea scabiosa* (Greater Knapweed), *Genista tinctoria* (Dyer's Greenweed), *Helianthemum nummularium* (Common Rock-rose), *Helminthotheca echioides* (Bristly Oxtongue), *Hippocrepis comosa* (Horseshoe Vetch), *Leontodon hispidus* (Rough Hawkbit), *Lotus corniculatus* (Common Bird's-foot-trefoil), *Origanum vulgare* (Wild Marjoram), *Pilosella officinarum* (Mouse-ear Hawkweed), *Pimpinella saxifraga* (Burnet Saxifrage), *Polygala vulgaris* (Common

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[227] D.A. Pearman (2007). 'Far from any house' – assessing the status of doubtfully native species in the flora of the British Isles. *Watsonia* 26: 271-290.

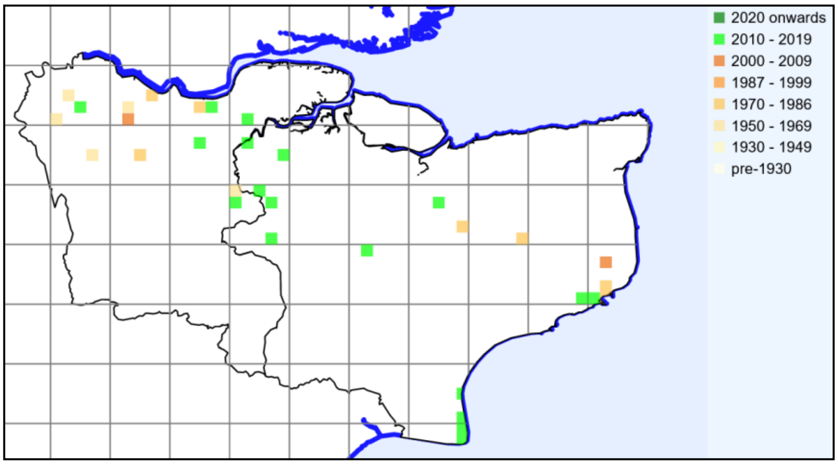
Milkwort), Poterium *sanguisorba* (Salad Burnet), *Primula veris* (Cowslip) and *Ranunculus bulbosus* (Bulbous Buttercup).

Whinlees Downs.
Photo by Sue Buckingham, June 2014

Cypress Spurge is a perennial, spreading by its rhizomes and by seed, except for a sterile diploid form propagated as a garden ornamental, which is believed to have arisen as a mutant between 1768 and 1818[228]. At Whinlees Down, a rare rust (*Uromyces scutellatus*, a potential biocontrol agent for some weedy spurges) has been found growing on some of the sterile shoots, which then deform, developing broad, instead of linear, leaves with dark spore masses on the undersides.

The following distribution map largely relates to introduced or escaped plants; status, where inferable, is noted in the data table below.

***Euphorbia cyparissias* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Site	Grid reference	Site status	Last record date	Recorder	Comments
Sidcup (metropolitan vc16)	TQ4572		3 July 2015	RMB	Coming up through tarmac of pavement outside 66 Brooklands Avenue, spread from garden.
Tripcock Ness (metropolitan vc16)	Probably TQ4580		20 May 1984	RMB	SW of the Ness, a large patch with another of *E. x pseudovirgata*. Site since fenced off and unviewable.
Hall Place, Bexley (metropolitan vc16)	TQ5074		1999	JRP	Weed on walls.
Hextable	TQ5270		13 September 2007	JRP	
Sole Street - Camer	TQ6567		(1) 29 July 2011 (2) 23 July 1993	(1) RR (2) JP	(1) At TQ 658 671 beside the Wealdway footpath bordering an arable field a large patch in bloom. The patch extended for c.20 metres in length and c.1 metre in depth. (2) TQ 658 671, by Wealdway.
Chalk	TQ6772		2 May 2017	GK	Pavement weed, garden escape.
South of Ditton	TQ7156		31 July 2019	BW	Garden escape

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[228] A.E. Stahevitch, C.W. Crompton & W.A. Wojtas (1988). The biology of Canadian weeds 85. *Euphorbia cyparissias* L. Canadian Journal of Plant Science 68: 175-191.

Medway Bridges area	TQ7267		30 April 2010	GK	TQ 72699 67930, patch c. 3x2m on chalk roadside, Roman Road, spreading into rough vegetation and presumed to be an escape (still present 22 May 2012).
Wainscott	TQ7371		13 July 2011	BS	
East Aylesford	TQ7458		29 April 2019	DM	15 plants opposite Cobtree entrance TQ 74274 58667, road verge adjoining industrial estate.
North Boughton Monchelsea	TQ7651		20 April 2016	BW	
North Maidstone	TQ7657		6 April 2017	BW	
Darland Banks	TQ7865		After 1990, before 2006	EGP (Philp, 2010)	Given as TQ76X and may well be the same as EGP's 1989 record at TQ 785 650.
Darland Banks	TQ7965	Access land	(1) 21 July 2023 (2) 28 May 2015 (3) 4 May 2014 (4) 7 June 2010	(1) KBRG meeting (2) DC (3) DS (4) SP & DG	(1) Darland Banks, at TQ 7934 6545. (2) TQ7965 (3) TQ 791 656, patches covering 10m x 0.5m either side of path on sw facing slope, Darland Bank. 43) TQ 79348 65458, Darland Banks, patch about 5 x 5 metres.
Charing Heath	TQ9248		24 June 2018	SL	Proposed extension to Hurst Wood, Charing Heath (AS68), KWT survey, plantation/scrub on north bank of HS1, TQ 92980 48496. 10 metre patch in flower in middle of fairly dense scrub under gap in canopy above, unlikely to survive in long term as scrub develops.
Lade	TR02V		14 September 2006	EGP	Roadside verge, garden escape.
Selling	TR0546		4 September 2010	LR	A couple of plants, although of uncertain status on earth piles following excavations.
Dungeness	TR0816	SSSI	25 May 2013	OL	Four plants by a large *Crambe maritima* about 200 metres away from a garden spreading patch (TR 08877 16844) next to the Old Lighthouse garden, TR 08859 16714.
Dungeness – Long Pits	TR0818		31 May 2013	OL	One small clump on north side of Battery Road, Dungeness/Lydd-on-sea. TR 08936 18592.
Lade	TR0820		28 May 2013	OL	One clump at base of railway sign on the Romney, Hythe and Dymchurch railway at the Williamson Road crossing, Lade, TR 08495 20501.
Littlestone	TR0824		(1) 17 April 2012 (2) 20 April 2010	(1) LR (2) GK	(2) TR 08433.24831, verge of St Andrew's Road, presumed originally planted but spreading strongly.
Western Dover (Elms Vale or Whinlees Down)	TR2941	CROW access land	(1) 23 October 2011 (2) 25 July 2010 (3) 5 May 1987	(1) SB (2) SC (3) NS & RF	(1) Plants spread over 10 metres of chalk grassland, TR 29800 41671. (2) Strong colonies. (3) TR292413, steep chalk scarp, south-facing *Bromopsis erecta* grassland. This location approximately where first recorded in East Kent, in 1876, and the next three sites below are probably all related.
Western Dover (Farthingloe)	TR24V	CROW access land	After 1990, before 2006	EGP (Philp, 2010)	
Western Dover	TR34A	CROW access land	25 June 1999	EGP & PHe	
Western Dover (Tower Hamlets)	TR3041	CROW access land	23 October 2011	SB	Many plants spread over 5 x 2 metres of chalk grassland TR 30052 41598.
Dover, Langdon Barracks	TR3344			FR & RF	[TR 334 411]. This grid reference is not quite accurate, for it lies within the waters of Dover Harbour, but it

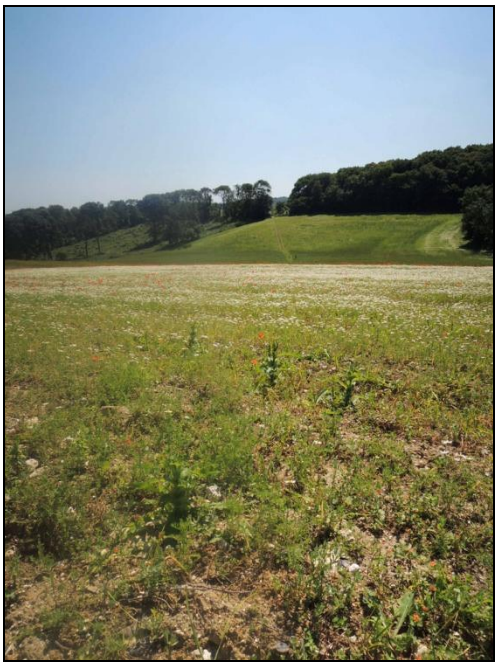
					was intended for the chalk grassland above the cliffs, below the former barracks, where also recorded by FR in 1948.
Martin Mill	TR34I		23 August 2006	EGP	Roadside verge, garden escape.

Euphorbia exigua L. (Dwarf Spurge)

vc 15 and 16

Rarity / scarcity status

Euphorbia exigua is a fairly common arable weed across south and east England, largely absent in Scotland and infrequent in Ireland. It has, as with many arable weeds, long been in decline with agricultural intensification. This trend continues, such that it is regarded **Vulnerable** to a risk of extinction, both in England and in Great Britain as a whole. In Kent, there is also evidence of serious decline in recent years, although it is still sufficiently frequent that no rarity / scarcity designation is called for. It is a Kent axiophyte, and so an indicator of good habitat.

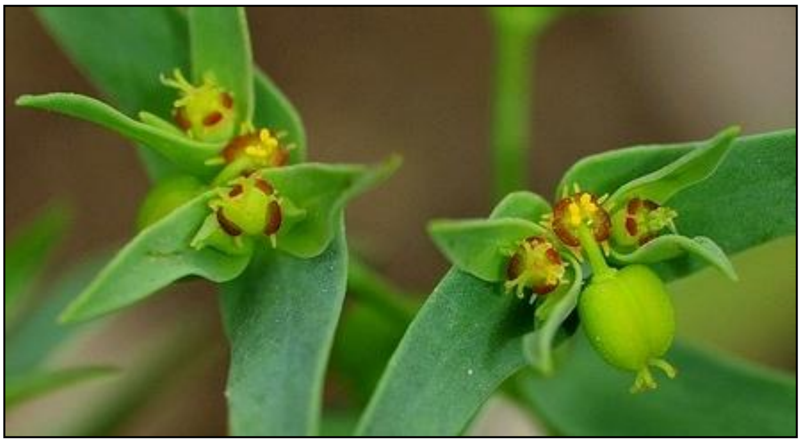


Kitchen Field, Ranscombe Farm, habitat.
Photo by Lliam Rooney, 24 July 2012

Account

The first record of Dwarf Spurge in Kent was by Thomas Johnson on 13 July 1629, as he travelled by the main road from Gravesend to Rochester (*Iter Plantarum*, 1629). Where noted at all by the early local Flora writers, it is regarded as very common in cornfields, and Hanbury & Marshall (1899) had little to say about this species other than that was frequent in cornfields, etc. in all districts.

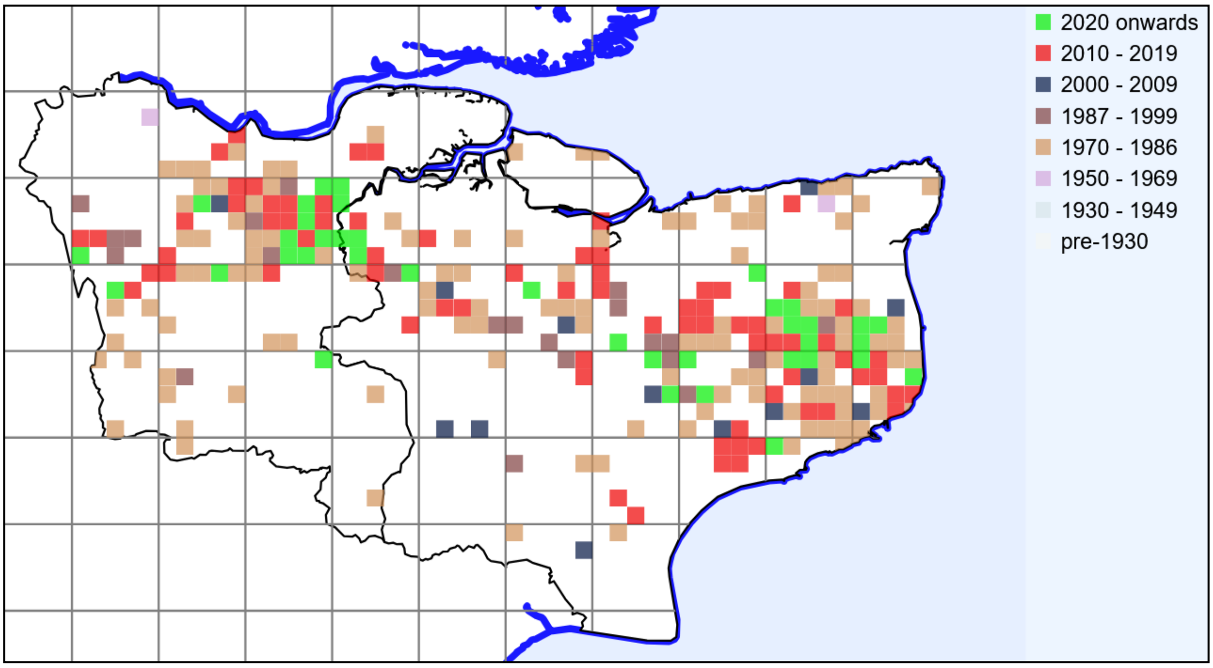
Francis Rose in his manuscript *Flora of Kent* gave numerous records 1943-62 and described it as a native of cornfields and waste ground, particularly on chalk; vey common on chalk, where it occurs also in natural habitats such as open chalk screes round rabbit warrens, etc.; quite widespread on other, mostly light soils, but absent from much of the Weald and from Romney Marsh, except on Lydd Common. By the time of Philp (1982), it was regarded as somewhat local, primarily a plant of the northern half of the county; and it was seen particularly in cornfields on the chalk, where it was usually common when found. This survey (1971-80) produced 200 tetrad records across the administrative county. The survey of 1991-2005 (Philp, 2010) shows a dramatic change, with only 74 tetrad records. The species seems to be in retreat to core areas of chalk arable in East Kent and around the Medway Gap. Agricultural practices, especially the heavy application of herbicides, appear to have been discouraging Dwarf Spurge, with other arable weeds. While undoubtedly there has been decline, our 2010-24 records (at 111 tetrads, 161 monads) do not indicate one quite as catastrophic, although a 45% decline since the 1970s is still very substantial.



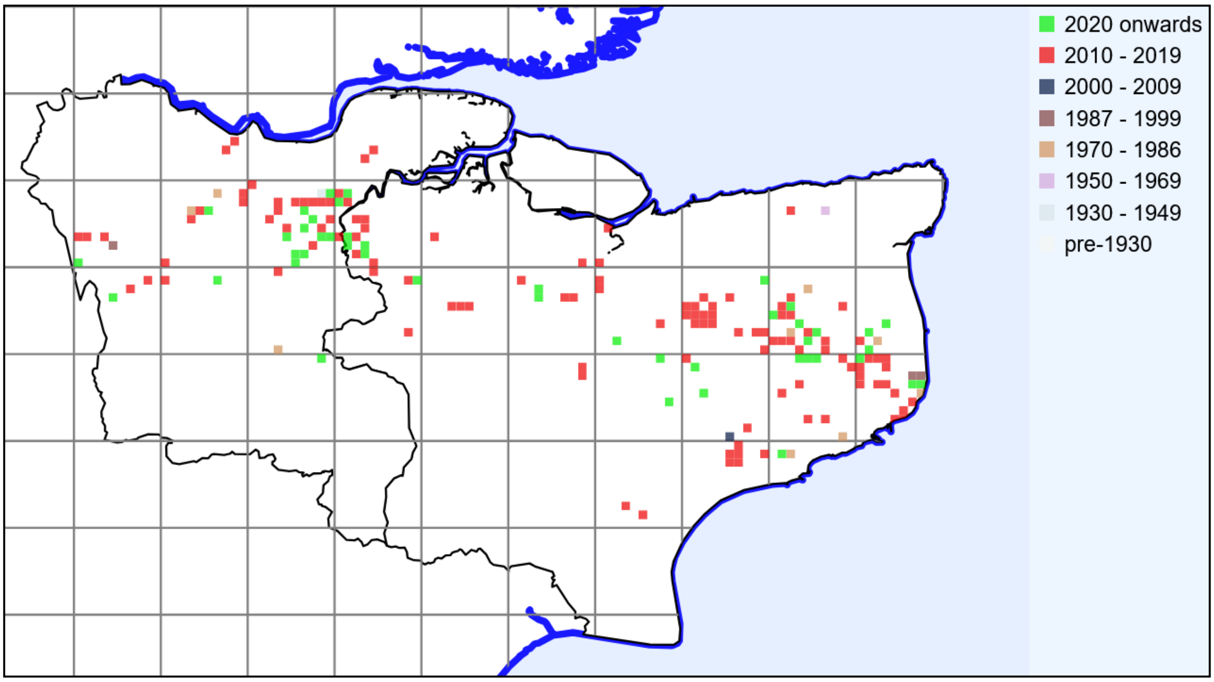
Ranscombe Farm. Photo by
Lliam Rooney, 24 June 2010

Loss is most effectively mapped at tetrad resolution, as below, so as to show now the species has retreated since the 1971-80 survey. Mapping at monad level (second map below) is largely limited to 2010-24 records, since monad recording only became usual in Kent from 2010.

***Euphorbia exigua* Kent records to 2024 mapped at tetrad level, from BSBI database.**

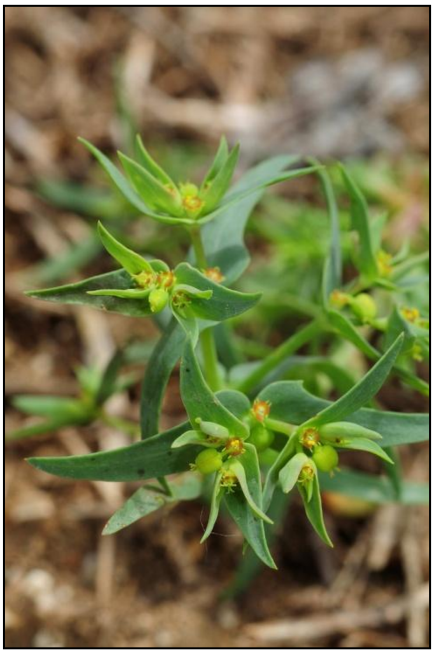

2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

***Euphorbia exigua* Kent records to 2024 mapped at monad level, from BSBI database.**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

The overwhelming majority of our sightings have been on arable margins (e. g. broad bean crops, flax, barley, maize and wheat), principally on chalk, but Gault Clay has also been noted. We have also recorded it in orchards and vineyards, especially when newly established, and on the semi-bare chalk surface of an abandoned chalk pit. The near-exclusive preference for arable raises the question as regards how cultivation affects germination. It is regarded as a spring germinator, with seed viability of one to five years in the seed-bank. French studies indicate that seed buried at 20cm in September so as in effect to provide a seed-bank had their germinative ability increased by this over time, and if the seed was extracted at different times of year and re-buried at 1.5cm to simulate cultivation, *Euphorbia exigua* seedlings were found to emerge from

April to early June, with a maximum of 13% viable seed producing seedlings. May cultivation was the least beneficial and germination is closely correlated with low temperatures and duration of burial.[229]



We have little data on Kentish associates, although *Euphorbia platyphyllos* (Broad-leaved Spurge), *Fumaria officinalis* (Common Fumitory), *Kickxia elatine* (Sharp-leaved Fluellen), *Kickxia spuria* (Round-leaved Fluellen) and *Valerianella dentata* (Narrow-fruited Cornsalad) have been listed.

Ranscombe Farm. Photo by Lliam Rooney, 9 June 2010

Euphorbia exigua is an annual, rarely perennial, and distinctive by virtue of its generally small size, linear leaves and greyish-green colour.

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[229] Lonchamp, J.P. *et al*. (1988). Effets de l'enfouissement des semences d'*Aethusia cynapium*, *Chenopodium album*, *Euphorbia exigua* et *Sinapis arvensis* sur leur capacité germinative et leur levée au champ. *Agronomie* **8**: 591-601.

Euphrasia confusa Pugsley (Confused Eyebright)

vc 15 and 16

Rarity / scarcity status

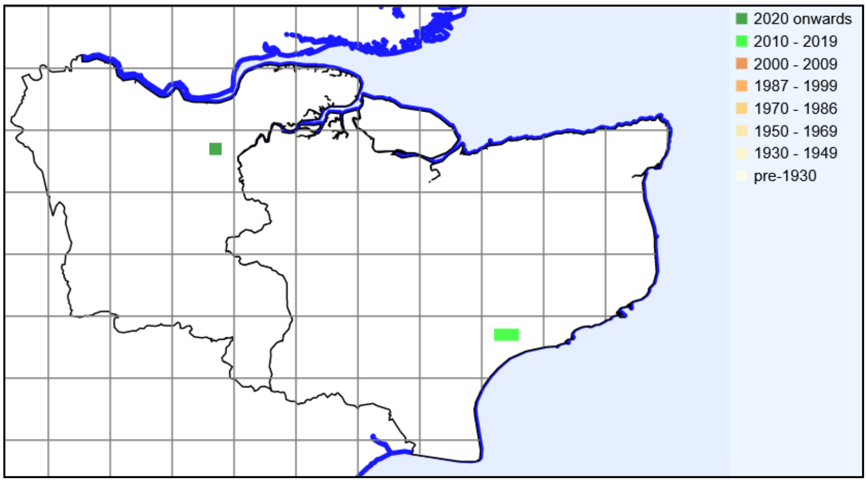
Euphrasia confusa is widespread in the British Isles, particularly favouring hill pastures in the north and west, but is largely absent from central and south east England. In both England and Great Britain as a whole, it is treated as **Vulnerable** to the risk of extinction. In Kent, it appeared to have been reduced to one area (two tetrads), but a 2020 report indicates another; the species is accordingly **rare** in the county.

Account

Euphrasia confusa was not named until 1919, although plants of this species were previously called *Euphrasia minima*. Marshall was aware of this taxon from other parts of Britain, but was not aware of it in Kent, so it receives no mention in Hanbury & Marshall (1899). The first published Kent records were given by Francis Rose (1960)[230] as at Gossy Banks, north east of Hythe, and at Sandling Park, north west of Hythe, discovered by L.J. Margetts and determined by E.F. Warburg. However, it seems that Francis Rose had already found this taxon in 1954 at Hoad's Wood (TQ94L) near Ashford, on a heathy ride on Weald Clay. The specimen, which is in **MNE**, was not determined by Warburg until 1961 ('seems to be *E. confusa*').

Pedlinge / Sandling Park, habitat. Photo by Sue Buckingham, 20 September 2013.

Although Philp (1982) gave the species for both Dartford Heath and Sandling Park, the 1991-2005 survey published as Philp (2010) only recorded it at Sandling Park, albeit in two tetrads. Its usual Kent habitat is heathy grassland, including in woodland rides. When re-found in those tetrads in 2013, one of the sites was a pocket of heathy grassland on sand, with *Galium saxatile* (Heath Bedstraw) and *Calluna vulgaris* (Heather) present, protected on three sides by woodland and with a margin of *Pteridium aquilinum* (Bracken). The other tetrad site held coarser vegetation, but with acid indicators present such as *Veronica officinalis* (Heath Speedwell) and *Agrostis capillaris* (Common Bent), the ground appearing impoverished.



***Euphrasia confusa* Kent records to 2024 mapped at tetrad level, from BSBI database.**

In 2020, however, a few plants were reported from chalk grassland at Henley Down, Luddesdown with *Euphrasia nemorosa* (Common Eyebright) and hybrids. This was a surprising habitat for Kent, although elsewhere in the British Isles it is known in calcareous as well as acid grassland; our nearest other calcareous site appears to be the short chalk turf on the banks of the prehistoric earthwork at Cissbury Ring, West Sussex, where first recorded in 1998.

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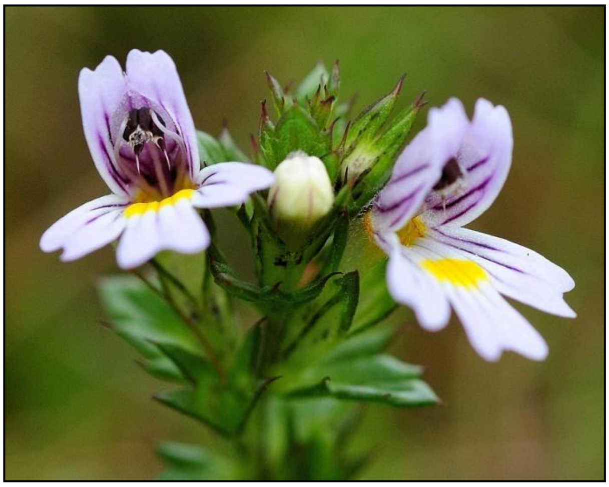
[230] F. Rose (1960). Botanical Records for Kent, 1955-58 – Vascular Plants. *Transactions of the Kent Field Club* 1: 56-65.

Confused Eyebright may be distinguished from other Kent species of *Euphrasia* by a combination of features: the middle and upper leaves either lack glandular hairs (as was the case with the 2013 Kent records), or if they possess them, their stalks are not more than six times as long as their gland-heads; it is an inland plant with flexuous stems and branches (i.e. not straight or gradually curved); the leaves near the base of the branches are very small; and the lower bracts are mostly alternate. In comparison with *Euphrasia nemorosa* (Common Eyebright), the lilac flowers appear large and the plants themselves slender and somewhat delicate.



Confused Eyebright at Pedlinge / Sandling Park. Photos by Lliam Rooney, 20 September 2013

The hybrid with *Euphrasia nemorosa* (Common Eyebright) is, despite under-recording, known to be widespread in the British Isles. Francis Rose's collection from Hoad's Wood included possible candidates; and it was considered present at the 2020 site at Luddesdown (see above). The hybrid with *Euphrasia officinalis* subsp. *anglica* (English Eyebright) has been found at Knole Park – see the account for that species.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Dartford Heath	TQ57G		August 1979	EGP (Philp, 1982)	
Luddesdown	TQ6666		15 July 2020	MAS	TQ 664 665, chalk grassland, Luddesdown, Henley Down, only one or two *confusa* plants (most were *nemorosa*); hybrids also present.
Sandling Park area	TR1336		(1) 4 September 2015 (2) 20 September 2013 (3) After 1990, before 2006	(1) SB (2) SB, LR & AG (3) EGP (Philp, 2010)	(1) Estimated population size this year at known site, TR1366 3618, was c. 300 plants. (2) 200 plants scattered in heathy grassland from TR 13641 36192 to TR 13680 36147. Associated species *Agrostis capillaris*, *Galium saxatile*, *Veronica officinalis* and *Rumex acetosella.* The area adjoins deciduous woodland with a margin of *Pteridium aquilinum* and two patches of *Calluna vulgaris*. (3) Given as TR13I.
Sandling Park area	TR13N		(1) 20 September 2013	(1) SB, LR & AG	(1) Many hundreds of plants on open grassy hillside within Sandling

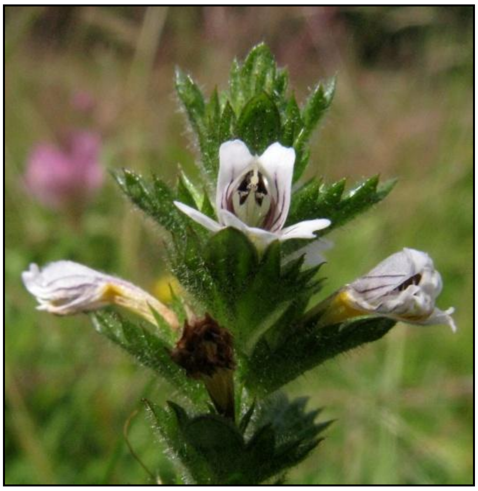
			(2) After 1990, before 2006	(2) EGP (Philp, 2010)	Park beginning at TR 14029 36165 and continuing (full extent not ascertained). Associated plants *Holcus lanatus, Agrostis capillaris, Anthoxanthum odoratum, Veronica officinalis, Potentilla anserina* and *Polygala serpyllifolia*. (2) Given as TR13N.

Euphrasia officinalis subsp. *anglica* (Pugsley) Silverside (English Eyebright)

vc 15 and 16

Rarity / scarcity status

English Eyebright is probably endemic to the British Isles and is local in southern Britain and in Ireland, although its distribution is imperfectly known. Despite this uncertainty, there appears to be evidence of decline, and the species is regarded both in England and Great Britain as a whole as **Endangered**, carrying a very high risk of extinction in the near future. It is is included as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. The number of county sites has reduced to a level at which this taxon would almost qualify for local scarcity, and in view of its decline as well, it is treated as **scarce** in Kent. It is a Kent axiophyte and so is indicative of good habitat.



Lord's / Wichling Wood. Photo by Sue Buckingham, 7 July 2014

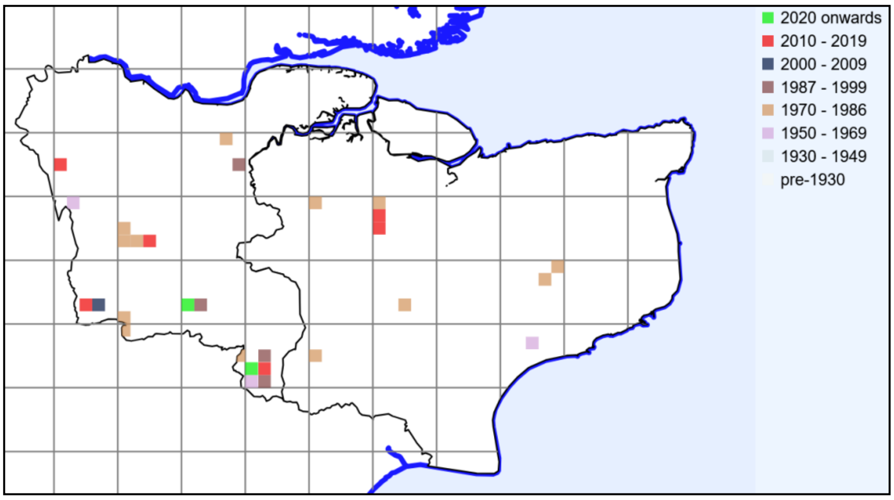
Account

Euphrasia officinalis subsp. *anglica* was only named (as *Euphrasia anglica*) in 1929, and earlier references to eyebrights are not easy to interpret. Hanbury & Marshall (1899) confessed that the various species and subspecies had received hardly any attention in Kent and this is apparent from the vagueness of their statements in relation to contemporary taxa ('Doubtless abundant'; 'Likely to occur frequently'; 'Probably quite common'; 'This should be found on many of the heaths'). Marshall did find in Surrey what later became known as this taxon, but it is not apparent that he also succeeded in Kent. The earliest Kent record currently traced is probably a specimen of 1838 in **MNE** marked as from Tunbridge Wells (determined by P.F. Yeo), although one cannot be confident which side of the vice county boundary it was found.

Lord's / Wichling Wood, chalk grassland habitat.
Photo by Sue Buckingham, 7 July 2014

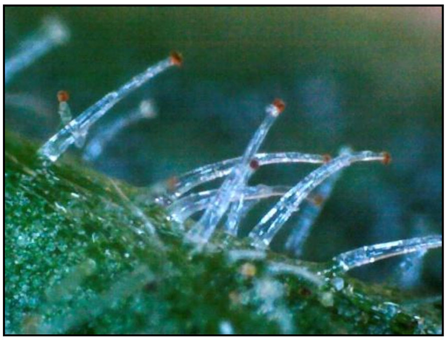
In the 1940s and 1950s it was widely recorded in the county, including from Holwood Park, Snodland, Halling, Covert Wood, Temple Ewell, Folkestone Warren, King's Wood (Langley), Hothfield, Kilndown Wood, Bedgebury, Goudhurst, Tenterden and Saltwood. Thereafter it continued to be recorded as widely scattered, albeit scarce, in Kent, with 19 tetrads recorded in Philp (1982). By the time of Philp (2010) the number of tetrads had reduced to ten in the administrative county, with a focus in the Weald, so there is some evidence of recent decline; and, indeed, only eight tetrad records (11 monads) have been made in 2010-24.

In Kent it has been recorded in grassy areas on acid soils, whether sand or wet clay. However, it has also been confirmed from short turf on the chalk downs. It hybridizes with *Euphrasia nemorosa* (Common Eyebright) and Philp (2010) noted the cross as present during the period 1990-2005 at Luddesdown (TQ66S, chalky bank), Mount Ephraim (TQ66W, open chalk scrub), Thurnham (TQ85E, chalk grassland) and Queendown Warren (TQ86G, chalk grassland slopes). Plants broadly resembled *E. nemorosa*, but upper leaves had the glandular hairs of English Eyebright. At none of these locations was pure English Eyebright then recorded. Possible hybrids with *Euphrasia pseudokerneri* (Chalk Eyebright) were noted near Snodland in 1954. Material collected from Knole Park in 2015 in the expectation that this was English Eyebright was determined by the expert panel of the BSBI project *An Eye for Eyebrights* as *Euphrasia officinalis* subsp. *anglica* (English Eyebright) x *E. confusa* (Confused Eyebright). Details are given in blue in the table below; but this determination may also have implications for earlier records from this location.



***Euphrasia officinalis* subsp. *anglica* Kent records to 2024 mapped at tetrad level, from BSBI database.**

English Eyebright is somewhat greyish-looking and distinctly glandular-haired. The length of the glandular hairs on middle and upper leaves is diagnostic for this species amongst Kent *Euphrasia*: the hair stalks should be at least six times, and generally 10 to 12 times, the length of the glandular heads borne by them.



Glandular hairs. Material from Lord's / Wichling Wood.
Photo by Lliam Rooney, 7 July 2014

Entries in blue relate to hybrid records

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Gilridge / Shernden	TQ44L		(1) 14 June 2015 (2) 8 July 2005	(1) SL (2) PHe & EGP	(1) TQ 4598 4320, widespread plants in flower across valley bottom at Cowden Pound Pastures KWT reserve, with large flowers and long glandular hairs on leaves. (2) Recorded as TQ44L.
Markbeech	TQ44R		8 July 2005	PHe & EGP	
Hayes Common (metropolitan vc16)	TQ4065		(1) 12 August 1989 (2) 1988	(1) LNHS meeting (2)GH	(1) Shown by GH, in (NE?) angle of West Common Rd / Croydon Rd crossroads. [Not refound by RMB when the exact location was revisited in 2006.] (2)TQ 406 651.
Keston (metropolitan vc16)	TQ4164		(1) 6 August 2016 (2) 6 July 2012	(1) SL (2) SB & class	(1) Keston, sloping meadow north of ponds, TQ 418 644. In flower at base of meadow. (2) Frequent in meadow, Keston Common, TQ 4181 6440.
Chiddingstone Hoath	TQ5141		1989	JP	Tubb's Hole Pastures, TQ 517 415.
Knole Park Fawke Common	TQ5452, TQ5453, TQ5533	SSSI	[(1) 23 July 2015] (2) 11 August 2014 (3) After 1990, before 2006	[(1) GK] (2)SB (3) EGP (Philp, 2010)	[(1) For at least 50m along Chestnut Walk, but probably much more extensive than this. Acid grassland, deer-grazed, on Greensand. Most plants were

					found on the southern side of Chestnut walk, where there is some tree shade and the sward is higher. Concentrations at (a) TQ54929 53382, a patch of 40 x 20cm, (b) TQ54925 53340, a patch of 10 x 10 cm, (c) TQ54932 53345, a patch of 2 x 1.5m, (d) TQ54961 53373, an area with plants scattered over 3 x 50m. Associated spp. *Agrostis capillaris, Anthoxanthum odoratum, Linum catharticum, Potentilla erecta, Senecio jacobaea, Trifolium repens, Viola riviniana*.] **Material collected was subsequently, however, redetermined as the hybrid with *E. confusa.*** (2) Frequent in acid grassland alongside Chestnut Walk in Knole Park e.g. at TQ 54338 52823, TQ 5495 5336 and TQ 5458 5306. Also at TQ 5503 5344 near the gate into Park. In all cases, associated spp: *Agrostis capillaris*, *Anthoxanthum odoratum*, *Potentilla erecta* and *Galium saxatile*. (3) Given as TQ55L, Fawke Common, but the site name may be general for the tetrad and represent part of Knole Park.
Pembury Walks	TQ6142		9 September 2004	JP & JW	TQ 619 424.
Pembury Hall	TQ64G, includes TQ6143		(1) 8 June 2024 (2) After 1990, before 2006	(1) SL (2) EGP (Philp, 2010)	(1) Tudeley Woods (Brakeybank Wood), south of Tudeley, TQ 6172 4369. Wide open track running down hill. Several flowering patches for 10 metres. (2) TQ64G.
Upper Halling	TQ66X		After 1990, before 2006	EGP (Philp, 2010)	
Combwell	TQ73B		24 July 2002	EGP	
Bedgebury	TQ7133	Access land	28 August 2016		Bedgebury Pinetum, path along edge of pond, TQ 7180 3355, with Tormentil, *Carex pilulifera*, *Solidago virgaurea* and *Calluna*.
Bedgebury	TQ7233	Access land	(1) 10 August 2011 (2) 10 July 1988	(1) KBRG meeting (2) EGP	(1) TQ 7209 3360, small colony of plants in valley bottom near *Oreopteris limbosperma.* (2) TQ 725 335.
Bedgebury	TQ7333	Access land	(1) 15 August 2014 (2) 26 August 1986	(1) LR & JA (2) JP	(1) Present on a woodland ride at TQ 73488 33421. (2) TQ 735 330.
Little Pix Hall	TQ73F		After 1990, before 2006	EGP (Philp, 2010)	
Three Chimneys	TQ73H		After 1990, before 2006	EGP (Philp, 2010)	
Lord’s Wood / Wichling Wood	TQ95C		(1) 22 August 2015 (2) 7 July 2014 (3) 2 July 2003	(1) KFC meeting (2) SB (2) BW & EGP	(1) A few plants scattered about midway up the slope at TQ 91864 56682, with typical calcicoles. (2) Very plentiful around TQ 901 558, some growing alongside *Anacamptis pyramidalis* and *Blackstonia perfoliata*. *E. nemorosa* also noted in some areas, but hybrid not seen. (3) TQ9055.

Euphrasia pseudokerneri Pugsley (Chalk or Large-flowered Eyebright)

vc 15 and 16

Rarity / scarcity status

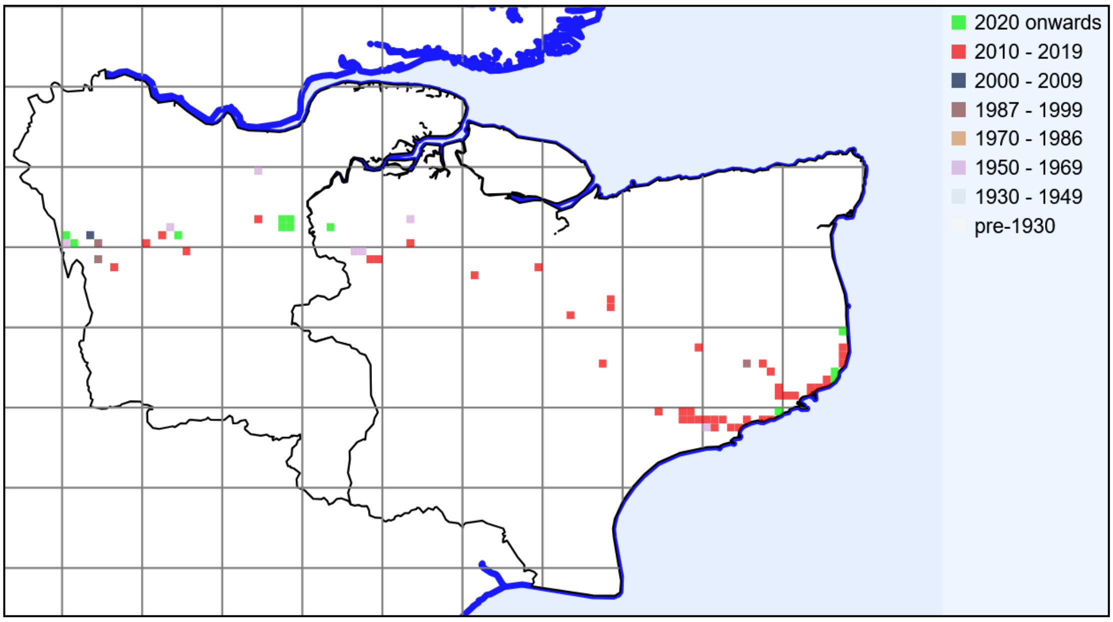
Chalk Eyebright is a plant of chalk and limestone in south east England, also found rarely in Wales and Ireland. It is probably endemic to the British Isles; it is **nationally scarce**; and as the species appears to be decreasing through ploughing up of habitat and through agricultural improvement of downland pastures, it is regarded as **Vulnerable** to the risk of extinction in the wild, in both England and Great Britain as a whole. It is is included as a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. The Kent North Downs are one of its British strongholds and the number of county sites is such that no local scarcity / rarity designation is required. It is a Kent axiophyte and so is indicative of good habitat.

Lydden / Temple Ewell. Photo by Lliam Rooney, 4 September 2012

Account

Chalk Eyebright was first published for Kent by Frederick Townend in his *Monograph of the British Species of Euphrasia* (*Journal of Botany*, 1897, at p.470), where he listed it (then known as *E. kerneri*) as found by A.H. Wolley Dod on chalk at Upper Halling in September 1894. It may not be the first finding, as there is a specimen at Manchester Museum collected by Dr Gustavus St Brody at Maidstone in 1891, which purports to be this species. Hanbury & Marshall (1899) had no records other than Upper Halling, but considered Chalk Eyebright likely to occur frequently on the downs. This no doubt was true, but there are relatively few records until the 1950s. Philp (1982) listed 42 tetrad records for the period 1971-80, along the North Downs from the Surrey border to the cliff tops of the east coast. By 1990-2005, the record total had become 28 tetrads (Philp, 2010), so this may be possible evidence of decline in Kent (as nationally), but not really supported by the number of sightings made subsequently (42 tetrads or 57 monads, 2010-24, with a focus along the chalk cliffs from Kingsdown to Folkestone, where the eyebright has been noted as especially abundant in the short cliff-top turf).

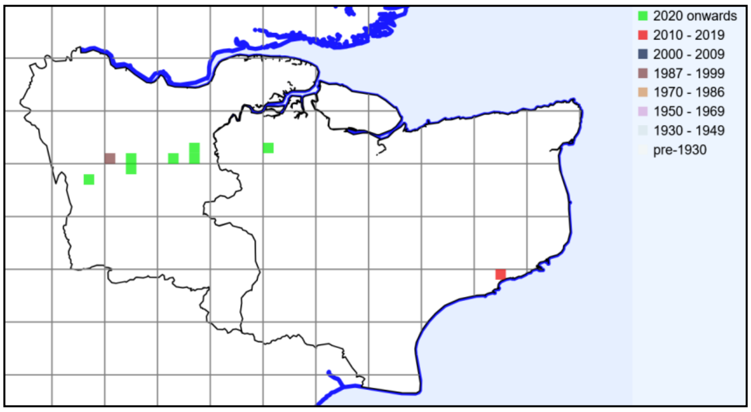
***Euphrasia pseudokerneri* Kent records to 2024 mapped at monad level, from BSBI database.**



Euphrasia pseudokerneri is a hemiparasitic annual of short downland turf, particularly on grazed higher slopes. It germinates in spring and is a late flowerer, in August, September or even October; and Alan Silverside (1994)[231] surmises that this perhaps affords some reproductive isolation from *Euphrasia nemorosa* (Common Eyebright), with which it hybridises. The latter species starts flowering in late June or early July and continues into the flowering period of Chalk Eyebright. *Euphrasia nemorosa* may replace Chalk Eyebright on lower slopes or rougher grassland, with hybrid swarms where species overlap. Philp (1982) refers to intermediate plants usually being present where the two species grow together, although the hybrid was not recorded specifically in that survey; and in Philp (2010) the only hybrid record was near Otford (TQ56A). There are earlier finds in chalk grassland (Hogtrough Hill at Brasted, 1954; Snodland, 1954; Luddesdown, 1959; St Margaret's Bay, 1959) which have been expertly determined as either possibly or probably this hybrid.

More recently, convincing hybrids have been seen at Folkestone Warren (TR 258 383, KBRG meeting on 9 June 2018) with corollas up to 10mm long (and so outside the range of *E. nemorosa*), flowering well before *E. pseudokerneri* begins[232]. From 2020, we started paying more attention to plants which were flowering in late May / early June but which bore larger corollas than usual for *E. nemorosa* and it appears that these putative hybrids are not uncommon, being seen at Brasted Hill, Kemsing Downs, Magpie Bottom, Trottiscliffe Downs, Birling Hill, Purple Hill. They are mapped below.

***Euphrasia nemorosa x pseudokerneri* Kent records to 2024 mapped at tetrad level, from BSBI database**



Lydden / Temple Ewell. Photo by Lliam Rooney, 4 September 2012

The two species are usually separated on the basis of:

- bracts (mostly long bristle-tipped in *E. pseudokerneri*, not so pronounced in *E. nemorosa* (but still acute to acuminate);
- capsule and calyx (capsule much shorter than the calyx in *E. pseudokerneri*; usually slightly shorter in *E. nemorosa*);
- flower size (corolla (6)7-9(11)mm in *E. pseudokerneri*; 5-7.5(8.5)mm in *E. nemorosa*).

The range of variation means that no single description will cover hybrid plants and, indeed, the variability of a population may best afford recognition; but those hybrid plants which may be identified more readily will have the large flowers and very sharp bract teeth of *E. pseudokerneri,* but the habit of *E. nemorosa.*

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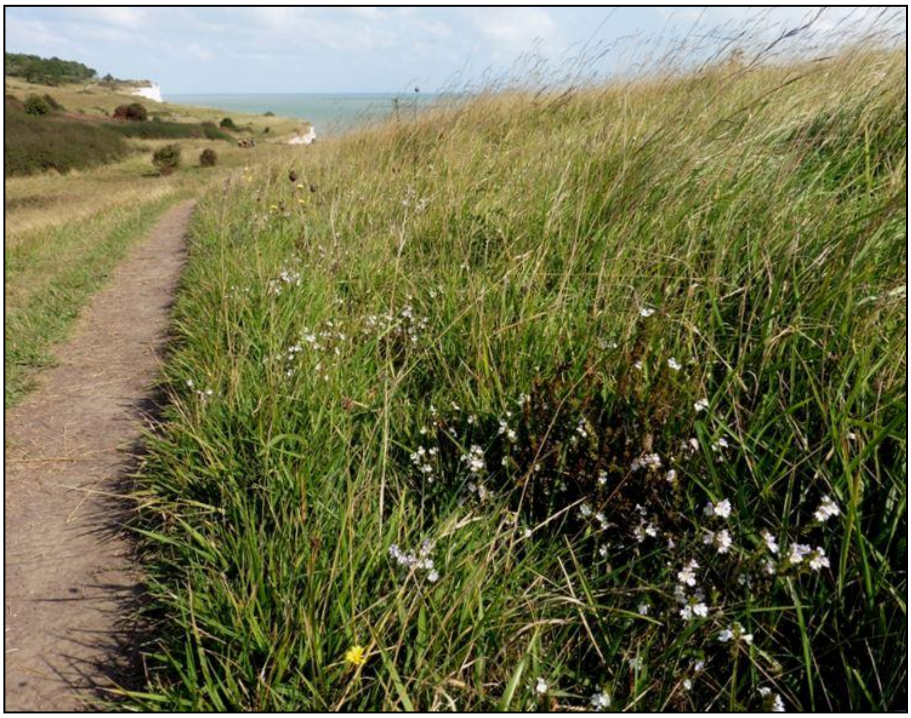
[231] A.J. Silverside, *Euphrasia pseudokerneri* Pugsley, in (eds.) A. Stewart, D.A. Pearman & C.D. Preston (1994), *Scarce Plants in Britain*, JNCC.

[232] Indeed, the hybrid often flowers before either parent: Metherell, C. & Rumsey, F.J. (2018). *Eyebrights (Euphrasia) of the UK and Ireland.* Botanical Society of Britain and Ireland, Bristol.

Hope Point**,** *Euphrasia pseudokerneri* habitat. Photo by Geoffrey Kitchener, 21 September 2014



Euphrasia tetraquetra (Bréb.) Arrond. (Western Eyebright)

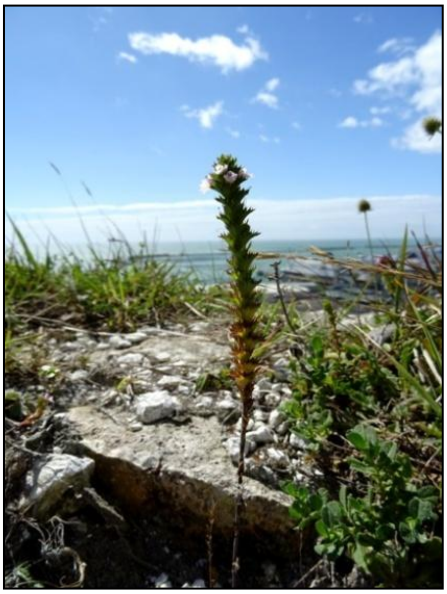
vc 15

Rarity / scarcity status

Western Eyebright is, in the British Isles, primarily a coastal species and, as its English name suggests, mainly distributed in the west. It is considered to be **Near Threatened** in both England and Great Britain as a whole, although some ostensible losses may relate to over-recording in the past. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 27% in the likelihood of recording the species. It is absent from much of eastern England and in Kent its records have been extremely limited and for a while the species was considered probably extinct. It has persisted near Dover, however, but is very **rare** in the county.

Account

Euphrasia tetraquetra was not recognised as a Kent species by Hanbury & Marshall (1899), but Marshall mentioned in the *Victoria History of the County of Kent* (1908) that he had received specimens (then called *Euphrasia occidentalis*) collected by C.P. Hurst near Walmer. There is an East Kent specimen in **CGE** gathered by C.P. Hurst in July 1901 (determined by P.F. Yeo) which appears to be the first Kent record. Francis Rose collected specimens in 1946-52 from the Folkestone/Dover area (TR23) and in 1953 from western East Kent (Wouldham Down, TQ76). There are also 1950s records by Barbara Nash along tracks from the monument north of St Margaret's Bay and at the cliff edge towards the lighthouse south of the bay.

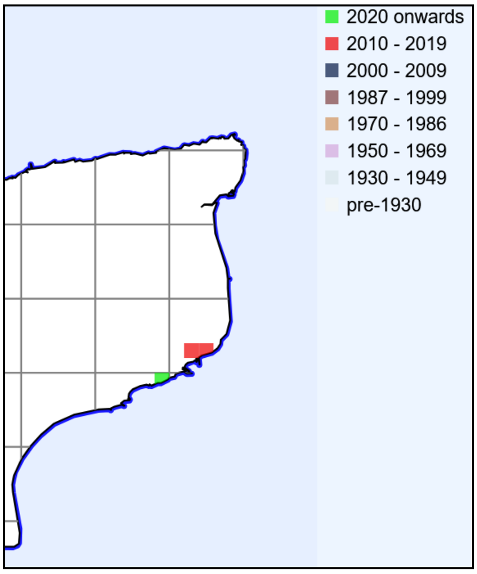


Dover. Photo by Stephen Lemon, 4 August 2017

By the 1971-80 Kent survey (Philp, 1982), the species was only known from grassland on chalk cliffs above Dover Harbour (TR34G), although it was surmised that it could perhaps be expected in similar habitats nearby. However, a dearth of subsequent records resulted in the species being placed on the county 'probably extinct' list until a KBRG meeting in August 2017. At this session several plants were identified as *Euphrasia tetraquetra* (at TR 34098 42324, TR 33839 42172 and TR 33832 421710) by Fred Rumsey in an area of cliff overlooking Dover Harbour, where the ground had been levelled off as part of railway construction at the end of the nineteenth century, so as to form what is now a grassy plateau about 80m above sea level, with chalk cliffs both above and below.

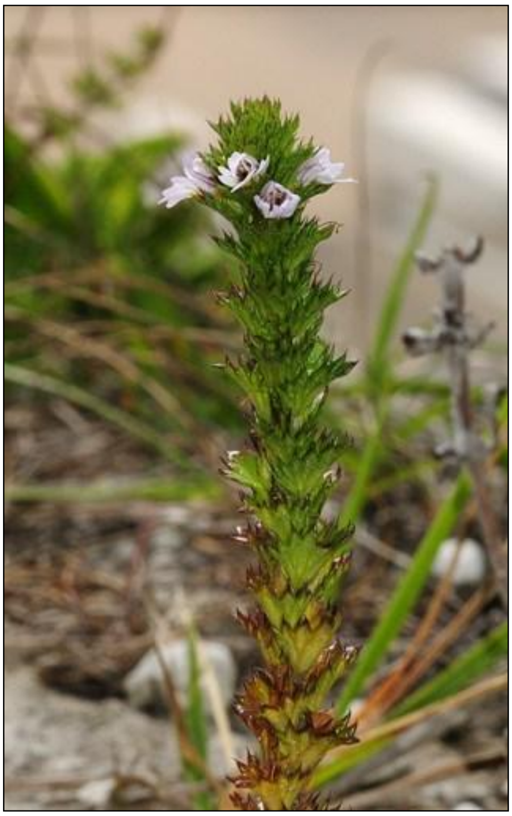
Dover, habitat. Photo by Sue Poyser, 4 August 2017

They grew in a southerly aspect, exposed to wind and sun, both in short chalk grassland turf and in barer areas near the cliff edge. Plants were also accompanied by *Euphrasia nemorosa* (Common Eyebright) and Eyebrights with a range of variation which rendered determination of individual plants in the field not straightforward, especially as *E. nemorosa* is apparently capable, in exposed coastal situations, of mimicking the growth form of *Euphrasia tetraquetra*. Some plants carried flowers of a size which suggested the influence of *Euphrasia pseudokerneri* (Chalk or Large-flowered Eyebright), although as a pure species this does not appear to be characteristic of the site, albeit plentiful along the coast further north east.



***Euphrasia tetraquetra* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Specimens exhibiting potential hybridity were subsequently determined by Chris Metherell, BSBI referee, as including on balance *E. pseudokerneri x tetraquetra* (at TR 34098 42324) and *E. nemorosa x tetraquetra* (at TR 34014 42364 and TR 33916 42318), as well as plain *E. nemorosa*. The latter cross had the sharp leaf toothing of *E. nemorosa* but with lower floral leaves too broad and flowering too low for that species. The former cross had the habit and facies of *E. tetraquetra* (i.e. with broad cauline and lower floral leaves, very congested lower floral internodes and occasional short glandular hairs); but was flowering too high for *E. tetraquetra* (some at node 13), and the large corolla size and white and papery calyces of some of the specimens pointed to involvement of *E. pseudokerneri*. It was likely that the area carried a hybrid swarm involving three species and in the centre of the swarm would be specimens showing a complete mix of characters produced by crossing and back-crossing. The rarity of "good" *E. tetraquetra* might be due to it effectively having been hybridised out.



Dover. Photo by Lliam Rooney, 4 August 2017

Some of the former range of the species has been restored by David Steere's finding on 29 May 2024 of several flowering plants on the north side of the path by the railway line near Samphire Hoe, TR 28926 39010 (determined by BSBI referee, Chris Metherell).

Euphrasia tetraquetra is distinguished from other Kent species by its stout, compact growth form, the main (or sometimes only) stem carrying a cylindrical, or slightly 4-sided, inflorescence. The lowest flower is present at node (3) 5-7 (9) of the main stem; other Kent species from similar habitat are likely to have the lowest flower at a higher node. The leaves are distinctively fleshy; and if there are glandular hairs on them, then they are relatively short, i.e. no more than six times as long as the glandular head which they bear.

Kent Rare Plant Register
Species accounts Part F

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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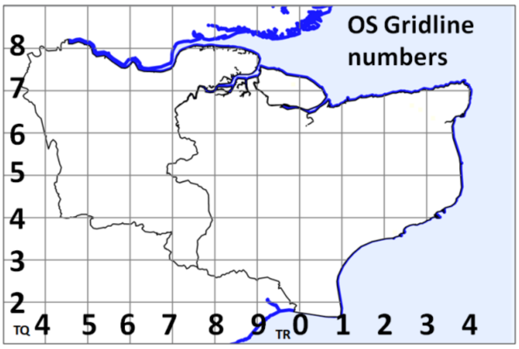
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at **tetrad** (2 x 2km squares) or **monad** (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AL Alex Lockton
AW Allan Ward
BBe Ben Benatt
BW Brian Woodhams
CO Colin Osborne
DC David Carder
DCh Danny Chesterman
DM Daphne Mills
DS David Steere
EGP Eric Philp
FR Francis Rose
GK Geoffrey Kitchener
JA Jan Armishaw
JBe Jim Bevan
JG José Gibbs
JLa Jacky Langton
JRP J.R. Palmer
KBRG Kent Botanical Recording Group
LM Lesley Mason
ML Mel Lloyd
MN Martin Newcombe
PHe Peter Heathcote
PHo Paul Holt
PW P.J. Wilson
RD R. Dix
RG Bob Gomes
RM Richard Moyse
RMB Rodney Burton
SB Sue Buckingham
SC Steve Coates
TI Tim Inskipp

Other abbreviations and references:

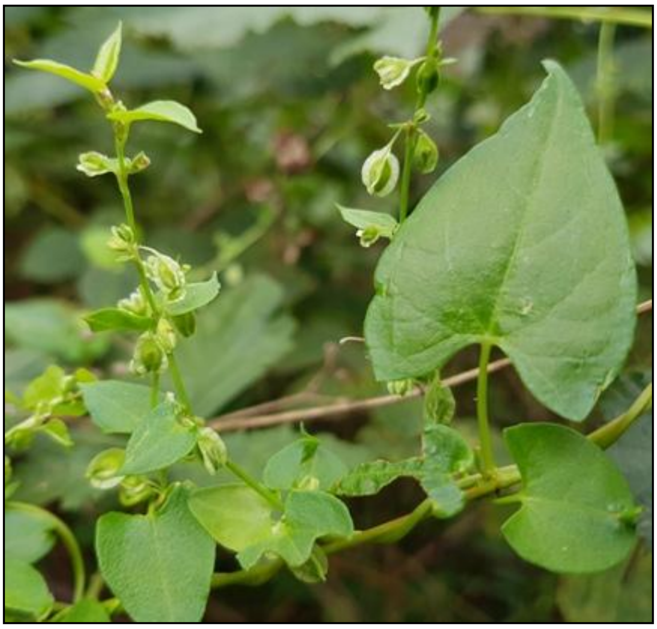
BM =Natural History Museum herbarium	Hanbury & Marshall (1899) refers to their *Flora of Kent*	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp	SLBI = South London Botanical Institute

Fallopia dumetorum (L.) Holub (Copse-bindweed)

vc 15, gone from vc16

Rarity / scarcity status

Fallopia dumetorum is very local in its British distribution, being concentrated in Surrey, Hampshire and West Sussex; it was also found in Oxfordshire in the 1980s, but not recently. It is regarded as **Vulnerable** to the risk of extinction. In England this risk assessment is based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 35% and its area of occupancy had declined so that there was a 34% reduction in the likelihood of recording the species. It is a declining **nationally scarce** species, probably through changes in traditional woodland management, and is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. In Kent, it has been regarded as probably extinct, in the absence of any finds since the 1970s; but in 2020 its presence was confirmed in three sites, one with a last previous record of 1948, and another with a last previous record of 1875. It is **rare** in the county, with appearances supposedly largely restricted to appropriate conditions in the woodland coppicing cycle, when the advent of light stimulates germination. However, it is possible that it should equally be regarded as a hedgerow plant, with potential for recruitment from woodland coppice, where this adjoins. It is treated as a Kent axiophyte, indicative of good habitat.



Potters Corner. Photo by Sue Buckingham, 27 August 2020

Account

The first published Kentish record was by the Rev. H.A. Stowell, curate of Luddenham 1853-7, in his 1857 listing of Faversham Plants (*Plantae rariores Favershamienses*)[233]. He described it as in the 'Lower part of Bysing Wood, towards Luddenham Vicarage; sparingly'. Hanbury & Marshall (1899) considered it to be a rare plant of hedgebanks and bushy places, very uncertain in its appearance. The only other records which they cited were in two or three spots behind Woolwich cemetery, found by A.H. Wolley Dod in 1894; in a hedge at the east end of Trinley Wood (Trenleypark Wood), found by F.M. Webb in 1875; and in woods near Potters Corner, Ashford, a find attributed to W.R. Jeffrey, an Ashford botanist, and Baker (presumably J.G. Baker of Kew). The Woolwich area had produced other finds not cited, with plants at Abbey Wood located in 1862, and seen by John Stuart Mill in 1863; presence continued at least up to 1948 (G.E. Matthews, given in Francis Rose's MS *Flora of Kent*), but it was not re-found on search in 2020.

In 1948, it was found by Dr. Cyril West, seen also by Francis Rose, at Cuckoo Wood, Sandling; (the BSBI database also assigns to R.A. Graham a 1948 record here, at TQ 760 578). Two years later it was noted in the hedge of a Lane, presumably Ram Lane, north east of Little Chart Forstal, at TQ 957 457 (E. Scott); it could not be found here on search in 2020. The Potters Corner site, however, has been the most constant, if constancy is not a contradiction for the character of this species, whose occurrence is so uncertain. Copse-bindweed has been recorded here by E. Scott and Colin Pope in 1950 and was found to be locally abundant from then to

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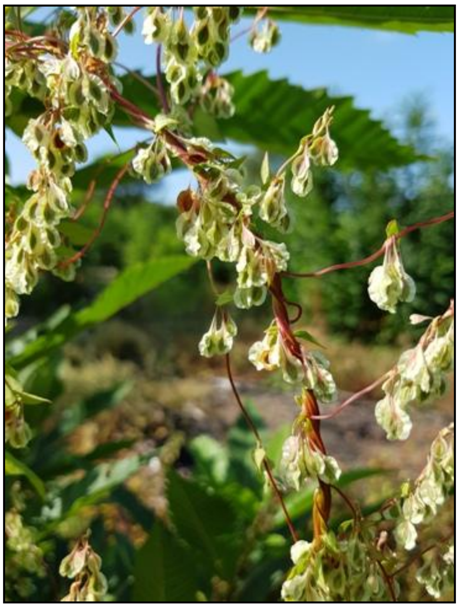
[233] *Phytologist* (1857) N.S. **2**: 154.

1952 by Francis Rose. In 1960 it was seen by Mrs B. Dodds; and Philp (1982) noted it in the 1971-80 county survey. It was not, however, found here, or in other earlier sites known to Eric Philp, in his 1991-2005 survey (Philp, 2010).

Habitat, Potters Corner. Photo by Sue Buckingham, 27 August 2020

Potters Corner, at the junction of Godinton Lane and the A20, lies on the sandstone of the Folkestone Formation and has given its name to a mediaeval pottery ware produced by an industry centred in the area in the 13th and 14th centuries. Early ordnance survey maps assign the name Potters Corner Wood to woodland in both southern and western corners of the crossroads here, the former corner being renamed Eyesend Plantation as from the 1898 ordnance survey. Whether this implies any grubbing out and replanting of the woodland is unclear (it is currently a chestnut wood, and neighbouring Lodge Wood was replanted with chestnut c.1860), but Hasted's *History and Topographical Survey of the County of Kent* (vol. 7, 1798) says 'toward the west, the soil is in general sand, having much quarrystone mixed with it, where there is a great deal of coppice wood, quite to Potters Corner, at the boundary of this parish' – so there is a long history of coppicing. This is very relevant to the survival of the Copse-bindweed, whose copious seeds apparently remain viable for many years, with germination stimulated by the disturbance of the soil so that it may appear in quantity when woods are felled or coppiced.[234]



Trenleypark Wood. Photo by Sue Buckingham, 17 September 2020

Its re-appearance at Potters Corner, found by Sue Buckingham on 27 August 2020, is in a marginal location benefiting from the absence of tree shading, approaching a gateway which gives access from the A20 into Eyesend Plantation at TQ 99354 44530. Google earth imagery from 2016 shows the chestnut just inside the wood at this point as having recently been coppiced, with consequential disturbance to the vicinity. The immediate associates were *Galium aparine* (Cleavers), *Rubus fruticosus* agg. (Bramble) and *Urtica dioica* (Common Nettle), through all of which it was able to scramble effectively. Two searches were made of the coppice within the wood, but no more *Fallopia dumetorum* was found. Its relative, *Fallopia convolvulus* (Black-bindweed), was, however, present on the woodland tracks.

This discovery prompted a search on 1 September 2020 of the 1948 Cuckoo Wood site, although a visit in 2013 had been unproductive. This wood also lies on the sand of the Folkestone Formation and has a large component of chestnut coppice-wood. The 2020 search, by Geoffrey Kitchener, revealed the presence of *F. dumetorum* in leaf litter on the disturbed verge of Sandling Lane adjoining Cuckoo Wood; this occurrence is discussed further towards the end of this account. No localised record within Cuckoo Wood was made, although it was believed present; but confusingly, there was much *F. convolvulus* in a recently coppiced area of the wood, behaving as might be expected with *F. dumetorum.*

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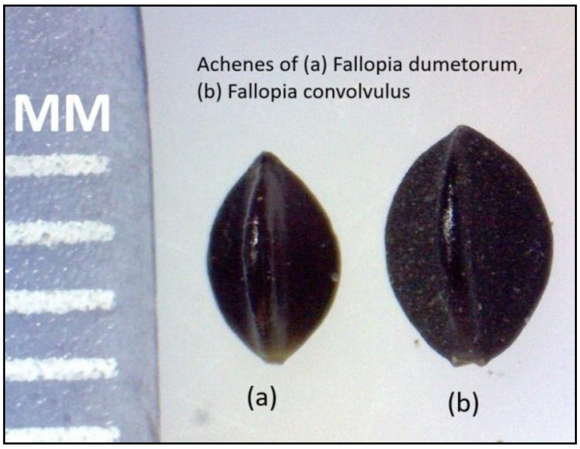
[234] Akeroyd, J.R. *Fallopia dumetorum* (L.) Holub Copse-bindweed. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. (1994) *Scarce Plants in Britain*, JNCC, Peterborough.

Habitat, Trenleypark Wood.
Photo by Sue Buckingham, 17 September 2020

The third recent site was in private woodland at the eastern end of Trenleypark Wood near Stodmarsh Road; the geology in this area is sand, from the Thanet Formation, in the vicinity partly overlain by the Lambeth Group. Rediscovery here, by Sue Buckingham in September 2020, was remarkable, given the last previous record was in 1875. There were at least a hundred and probably many more plants spread over an area of about 60 x 60 metres bounded by TR 19691 59636, TR 19755 59680 and TR 19742 59699 in chestnut coppice probably cut a year or so before. Many seem to have germinated around the edge of the old coppice fires and were also climbing up into the coppice poles, even over an old car tyre.

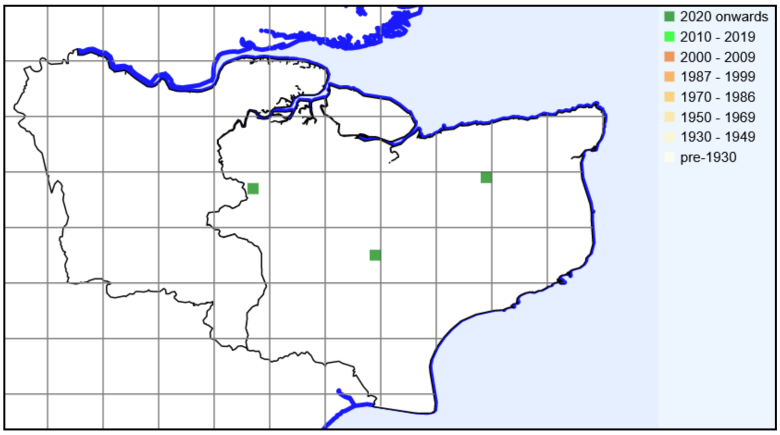
Associated plants included: *Circaea lutetiana* (Enchanter's-nightshade), *Chenopodium polyspermum* (Many-seeded Goosefoot), *Epilobium ciliatum* (American Willowherb), *Gnaphalium uliginosum* (Marsh Cudweed), *Persicaria maculosa* (Redshank), *Rumex acetosella* (Sheep's Sorrel), *Scrophularia nodosa* (Common Figwort), and *Silene dioica* (Red Campion). Where *F dumetorum* became more scattered at the eastern limit of its extent it was replaced by a carpet of *F. convolvulus*. Trenleypark, a deer park at Domesday, has a documented woodland history going back at least to the1420s, by when it had ceased to be an enclosed park; but the date of replanting with chestnut for coppicing is not known.

F. dumetorum is a climbing annual (up to 3m), fairly similar to the smaller *F. convolvulus*, especially when the latter has broad wings to its fruits (*forma subalata*). They are differentiated by the length of the fruiting pedicel (1-3mm in *F. convolvulus*; 5-8mm in *F. dumetorum*) and of the achenes: (3.5-)4-5mm long and dull in *F. convolvulus*; <3mm in *F. dumetorum* and glossy). The difference in size and surface texture of the achenes is illustrated here by Sue Buckingham from Potters Corner material.



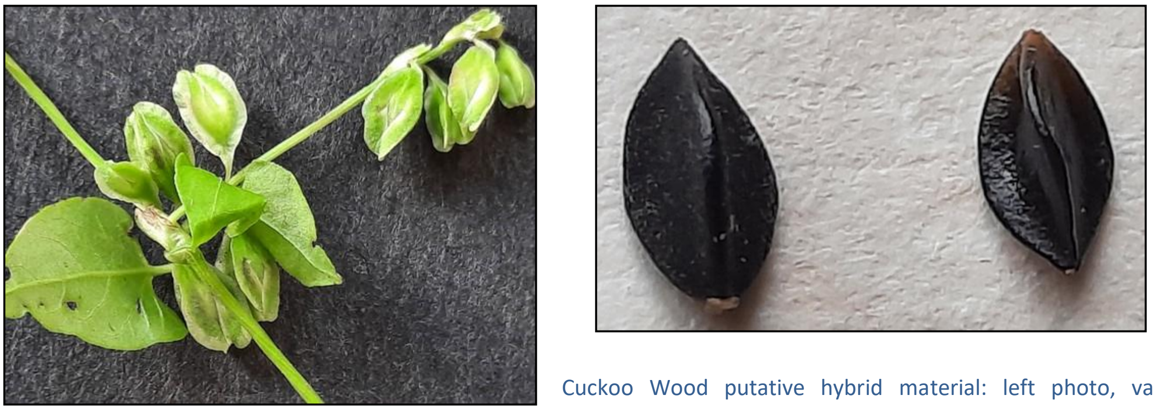
Achenes of (a) Fallopia dumetorum,
(b) Fallopia convolvulus

The general behaviour of *F. dumetorum* bears some resemblance to that of *Lotus angustissimus* (Slender Bird's-foot-trefoil) in Kent. Both were on the county 'probably extinct' list before being re-found, the length of their disappearance from record being associated with their reliance on the coppicing cycle to provide light and disturbance sufficient to enable germination as annuals. Remarkably, both have been found at Trenleypark Wood. However, it is entirely possible that *F. dumetorum* may continue as a hedgerow plant when adjacent woodland conditions no longer permit: thus the Potters Corner 2020 plant's habitat was nearer roadside than woodland; the Cuckoo Wood 2020 sighting was on a road verge; and the Trenleypark 1875 sighting was in a hedge where in 2020 it was within the wood.



***Fallopia dumetorum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

While our recent sightings have all noted *F. dumetorum* growing in proximity to *F. convolvulus*, the hybrid between the two (originally described from Switzerland) has hitherto been unconfirmed in the British Isles, according to the BSBI handbook Docks and Knotweeds of the British Isles[235]. However, the Cuckoo Wood find appears to bear the hallmarks of a hybrid population, with one *F. dumetorum* plant present, two *F. convolvulus* and four intermediate plants, putative hybrids, *F.* x *convolvuloides*, all within a 7.5m stretch of road-verge. The intermediate plants showed variation in the perianth wings from virtual absence to 0.9mm wide (which exceeds the winged form of *F. convolvulus*, var. *subalatum*, whose wings extend to no more than 0.4mm[236], but is less than the wings of *F. dumetorum*, at 1.5-2mm wide). They also showed variation in the achenes, having some of the glossiness of those of *F. dumetorum*, but at 3.5-4mm they exceeded the length of that species.



Cuckoo Wood putative hybrid material: left photo, variable perianths; right photo, achenes (the larger is *F. convolvulus*, the smaller is the putative hybrid). Photos by Daphne Mills, 4 September 2020.

However, the occurrence and persistence of a hybrid between such species faces considerable barriers, which would make it a rare event. *F. convolvulus* appears normally to be cleistogamous, although Hume *et al.* (1983)[237] report that a minority of flowers in greenhouse-grown plants were observed to open. *F. dumetorum* seems similarly shy to open its flowers, although published observations have not been traced. Any hybridisation would be interploidal (*F. dumetorum* 2n=20; *F. convolvulus* 2n=40), which may put barriers in the way of producing viable hybrid seed. Nevertheless, the plants observed suggest that slightly less than usually cleistogamous parent plants have in the past occurred in this disturbed area, with hybridisation, and possibly even introgression, having followed.

This account has benefited greatly from contributions by Sue Buckingham and Daphne Mills.

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[235] Akeroyd, J.R. (2014). *Docks and Knotweeds of Britain and Ireland (edn. 2)*. Botanical Society of Britain and Ireland, London.

[236] Measurement from Sell, P. & Murrell, G. (2018). *Flora of Great Britain and Ireland*, vol.1. Cambridge University Press, Cambridge. However, fresh material from arable at Eastry, found by Sue Buckingham in October 2020, had wings measured at 0.6mm, and the difference may be accounted for by shrinkage of herbarium material.

[237] Hume, L., Martinez, J. & Best, K. (1983). The Biology of Canadian Weeds 60: *Polygonum convolvulus* L., *Canadian Journal of Plant Science* **63**: 959-971, at p.965.

Festuca arenaria Osbeck (Rush-leaved Fescue)

vc 15, one historic record claimed for vc16

Rarity / scarcity status

Festuca arenaria is a **nationally scarce** plant, but fairly widely distributed around the coasts of Great Britain in appropriate habitats, primarily sand dunes and sandy shingle, and its conservation status is one of 'Least Concern' in both England and Great Britain as a whole. In Kent, it is **rare**. It is treated as a Kent axiophyte, indicative of good habitat.

Account

The history of Rush-leaved Fescue in Kent is complicated by the differing views which have been taken over its naming generally. Indeed, it is still a question as regards whether to recognise *Festuca arenaria* with two subspecies, subsp. *arenaria* and subsp. *oraria*, or whether these should both be subspecies of *Festuca rubra* (Red Fescue) instead. In the past, subsp. *oraria* has been treated as a separate species, *Festuca juncifolia.* Hanbury & Marshall (1899) considered whether *Festuca rubra* var. *arenaria* occurred in the county, having regard to its inclusion in *Topographical Botany* (1873-74) for East Kent on the authority of G.E. Smith. They came to the conclusion that they were not satisfied that it had really been found and noted that confusion over naming in relation to *Festuca rubra* did not help.

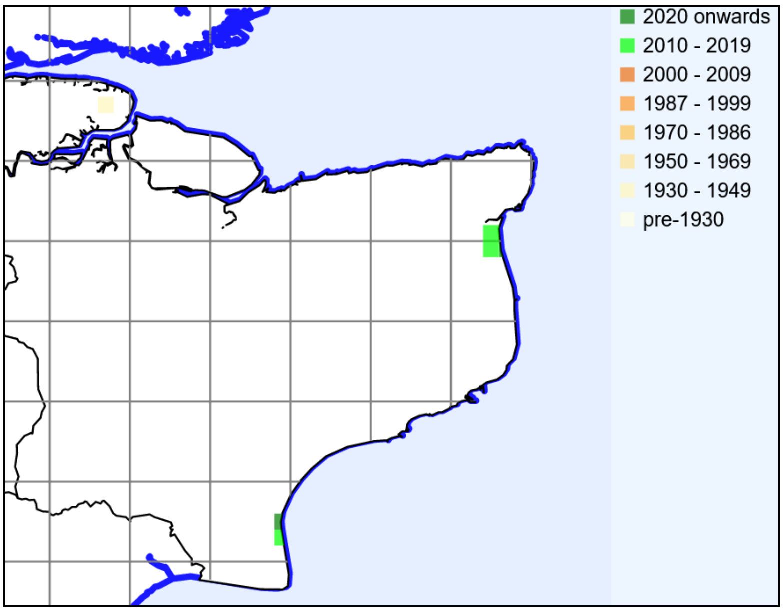
However, it appears that Rush-leaved Fescue must have been present after all. Most of the early modern Kent records came from Sandwich Bay, where various recorders noted it, at least from the 1930s onwards. Francis Rose described it (in his manuscript *Flora of Kent*) as growing on 'fixed dunes, and white dunes becoming fixed; rare, but very locally abundant on the Sandwich dunes and at Shellness in Sheppey'. The reference to Sheppey was based on a 1962 occurrence on shell sand in a community of *Ammophila arenaria* (Marram). He noted no West Kent records, although R.A. Boniface claimed a 1947 sighting from the Isle of Grain. Rush-leaved Fescue was noted in Philp (1982) as subspecies *arenaria* of *Festuca rubra*, present on coastal sand-dunes in the Greatstone and Sandwich Bay areas. Those two locations also provided the three tetrad records given in Philp (2010).

Littlestone. Photos by Lliam Rooney, 5 June 2010

The species generally favours sand dunes in the county, although some plants at Littlestone occupy a more artificial habitat, being associated with the coastal road margin and its concrete structures where sand has blown or there is consolidated shingle. Eric Philp noted a strict zone limitation, by which the species grows in fairly open sand between *Elymus junceiformis* (Sand Couch) and before the more closed *Festuca rubra* (Red Fescue) turf. Its Kent distribution is echoed by that of *Vulpia fasciculata* (Dune

Fescue) and there is the potential for intergeneric hybridity, likely hybrids from Sandwich Bay having been reported in 1967 (probably from the early 1960s).

The Rush-leaved Fescue is recognisable from its stiff, rush-like leaves (stiffer in subspecies *arenaria* than in subspecies *oraria,* but both stiffer than Red Fescue). The upper ribs are densely hairy (Red Fescue's being scabrid or only sparsely hairy).



***Festuca arenaria* Kent records to 2024 mapped at tetrad level, from BSBI database.**

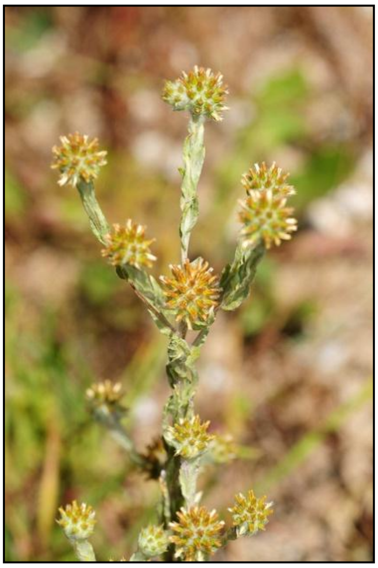
Site	Grid reference	Site status	Last record date	Recorder	Comments
Greatstone	TR0822		(1) 29 June 2013 (2) After 1990, before 2006	(1) TI (2) EGP (Philp, 2010)	(2) Record given as TR02W, so may relate to neighbouring monad.
Greatstone	TR0823	SSSI	(1) 2018 (2) 19 June 2000	(1) LM (2) FR	(1) South of the Lifeboat station at the top of the beach. (2) Dunes, TR 082 233.
Littlestone	TR0825	SSSI	(1) 17 September 2021 (2) 5 June 2010	(1) SB (2) KBRG meeting	(1) Shingle beach. (2) Clumps by Coast Road at TR 08692 25697, TR 0868 2567, more outside Romney Bay House and scattered southwards at least as far as TR 0865 2538. Det. BW.
Sandwich Bay	TR35P & 35U		After 1990, before 2006	EGP (Philp, 2010)	The TR3658 record below is also within TR35P.
Sandwich Bay	TR3559		26 May 2017	SB	
Sandwich Bay	TR3560		26 May 2017	SB	
Sandwich Bay	TR3561	SSSI	8 September 1998	PW	TR 351 619, in sand dunes with *Dianthus armeria.*
Sandwich Bay	TR3658	SSSI	(1) 23 May 2022 (2) 26 June 2013	(1) KBRG meeting (2) SB	(1) Beach dunes (2) Patch on bare sand in dunes at TR 36046 58377 with *Bromus hordeaceus* subsp *thominei.*

Filago germanica L. (Filago vulgaris Lam.) (Common Cudweed)

vc 15 and 16

Rarity / scarcity status

Common Cudweed, despite its name, is regarded as **Near Threatened** in both England and Great Britain as a whole because a trend of decline is bringing it close to qualifying as at risk in the wild. Whilst still fairly widespread in the British Isles, the species has at least up to 2000 been markedly diminishing in south and west England and in Ireland, probably through changing agricultural practices and cultivation of marginal land. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 24% in the likelihood of recording the species. In Kent, the number of sites means that it is not regarded as rare or scarce; and data since 1971, if anything, suggest that the species is increasing substantially in the county.



Selling. Photo by Lliam Rooney, 10 July 2010

Account

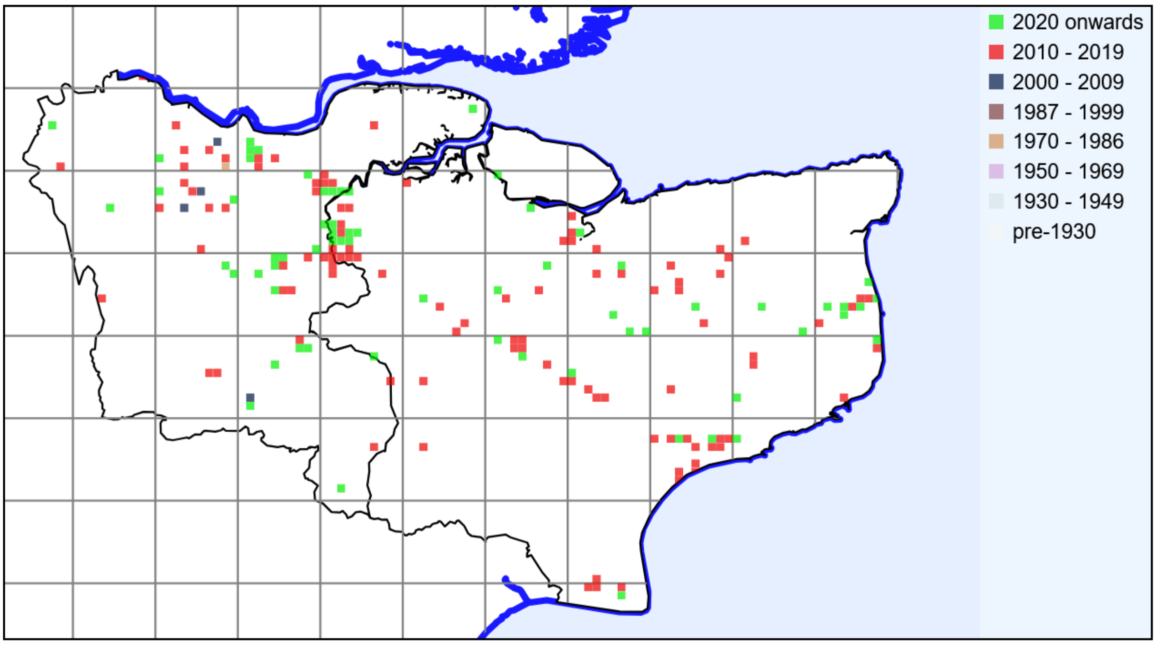
The first published record of Common Cudweed in Kent may well be a reference by Thomas Johnson to *Gnaphalium vulgare* in his *Iter Plantarum* (1629), as encountered on a journey between Gravesend and Rochester. Hanbury & Marshall (1899) equated this plant name with Common Cudweed; but Francis Rose considered that *Gnaphalium uliginosum* (Marsh Cudweed) was a possible alternative identification. The species was treated by Hanbury and Marshall as common throughout the county in dry fields and on banks, and so not requiring enumeration of any individual records. Francis Rose described it as a native of open ground on heaths, dry grassland, dry banks, arable fields, quarries, fixed dunes, on sand or gravel soils, or more rarely on chalk, frequent in north and central Kent, much rarer in the Weald, and absent from heavy soils. He knew of it (1940s-60s) in 21 hectads.

However, by the time of Philp (1982), it was rather local and uncommon, being recorded in only 23 tetrads, generally on dry roadside banks, quarries and waste places on sandy soil. Against a background of national decline, it is at first sight surprising that the survey recorded in Philp (2010) showed an increase to 41 tetrads. The basic distribution remained the same with very little in West Kent, a scatter in East Kent and a line following the Folkestone Sands from Maidstone south-eastwards. The distribution on sandy ground, however, was more pronounced, with a noticeable increase around Maidstone. Whilst this increase might be an artefact of recording methods, subsequent recording strongly supports the status of the species as one which is increasing in Kent.

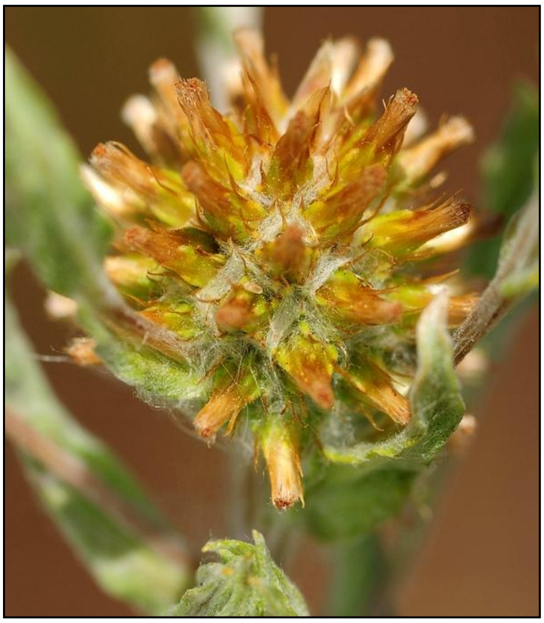
Medway Bridges, habitat. Photo by David Steere, 27 August 2021

For the period 2010-24 we have records in 127 tetrads (170 monads), an increase of some 450% since the 1970s. The cause of increase is not obvious, but may have something to do with ubiquitous ground disturbance and an ability to cope with dry summers.

Filago germanica **Kent records to 2024 mapped at monad level, from BSBI database.**



Filago germanica is an annual of dry, open ground, spring- or autumn-germinating. In Kent it has been recorded on motorway banks; colliery spoil; gravel pits; dunes; consolidated shingle; arable margins; dry gravelly heath; hardstanding; sandy ground in quarries, fields or on roadsides; and more rarely on calcareous ground, such as in stubble on chalk and in association with cement works.



Selling. Photo by Lliam Rooney, 10 July 2010. Over 30 capitula are visible on this head.

It is, with *Gnaphalium uliginosum* (Marsh Cudweed), the cudweed most likely to be encountered in Kent. It may be distinguished from *Filago pyramidata* (Broad-leaved Cudweed) by the characters mentioned in the account for that species. Very small plants may resemble *Logfia minima* (Small Cudweed), but the latter species should have eight or less capitula in each head, whilst *F. germanica* has between eight and 40. Within the range of five to fourteen capitula, however, there can be a degree of overlap and so it is best to check the outer phyllaries around an individual capitulum (not to be confused with the leaves which subtend the entire head of capitula). The phyllaries are blunt in *Logfia minima*, long-tapering in *F. germanica*.

Filago pyramidata L. (Broad-leaved Cudweed)

vc 16; gone from vc 15

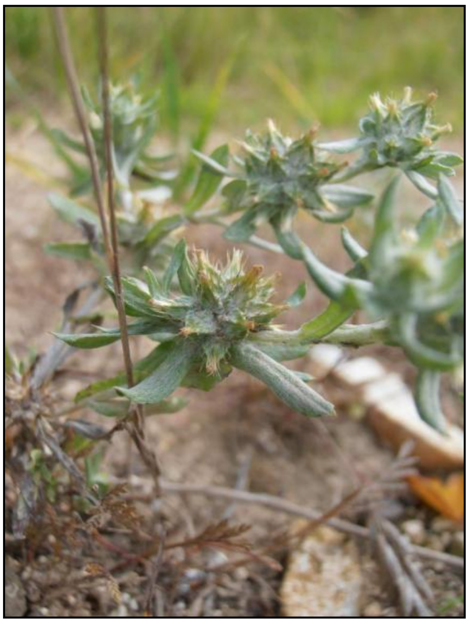
Rarity / scarcity status

The Broad-leaved Cudweed is nationally scarce and listed as **Endangered** in both England and Great Britain as a whole and so facing a high risk of extinction in the wild. It is an archaeophyte, or ancient introduction, whose presence as an arable weed in south east England has declined substantially, probably due to agricultural changes such as herbicide use and autumn cereal growing. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006, a plant protected under Schedule 8 of the Wildlife and Countryside Act 1981 and is a Kent axiophyte, indicative of good habitat.

There are very few extant sites in Britain. Phil Wilson listed[238] 42 British sites (excluding misidentifications) from which the species had been recorded since 1945, and of these, only eight had records confirmed since 1990. The largest of these is currently the Plantlife reserve at Ranscombe Farm, West Kent. Although this site harbours millions of plants, in Kent the species is treated as **rare**.

Account

The first published record for *Filago pyramidata* in Kent is by J.T.B. Syme in the 3rd edition of *English Botany* (vol. 5, 1866), but this does no more than mention the county. It may well relate to a find by him at Darenth Wood in 1853 (specimen in the Natural History Museum), but it is preceded by an 1842 Dartford Heath specimen gathered anonymously for the Botanical Society of London and mis-labelled *Filago germanica* (= *Filago vulgaris*, Common Cudweed). Apparently the two species were subject to much confusion in the 19th century (and indeed, later). Hanbury & Marshall (1899) found Broad-leaved Cudweed to be local in fields and waste ground, chiefly on the chalk. Amongst their cited locations, Hanbury himself found it abundant in cornfields between Ringwould and St Margaret's in East Kent and F.M. Webb contributed to the 1899 *Flora of Kent* an 1875 record near Luddesdown – presumably the present Ranscombe Farm site.



Ranscombe Farm. Photo by Richard Moyse / Plantlife, 2011

The range of 19th century sites in Kent does not seem to be sustained beyond 1900, which may suggest that the agricultural changes suggested as a cause for national decline (operating primarily in the mid- to late 20th century) may not be applicable locally. There is evidence of the continued existence of the Ranscombe Farm population, with records from T.J. Foggitt in 1924, A.R. Horwood in 1928 and Francis Rose from 1943 to 1960. The adoption of the species nationally by Plantlife as part of the 'Back from the Brink' project led to a series of population assessments and reports, giving totals for Ranscombe of 60,000 plants in 1994, 20,000 in 1995, 10,000 in 1996, 5-10,000 in 1998 and over 1,000 in 2000. This must be set against variable earlier estimates (e.g. over 500 in 1985), but suggests a decline latterly in spite of management under an agreement with English Nature from 1985. However, in 2005 Plantlife established the farm as a nature reserve and changed conventional agricultural use to management targeted specifically for arable wild plants.

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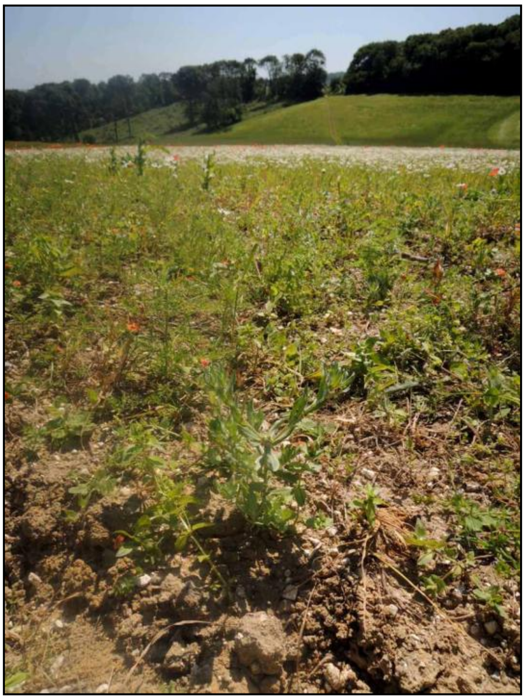
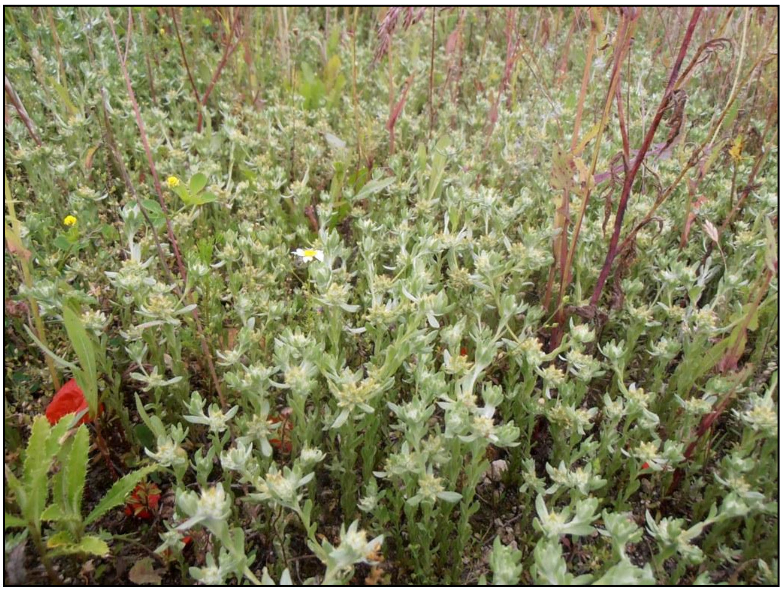
[238] P.J. Wilson. *Filago pyramidata* in 1998: Plantlife Report no. 124 (1999).

The effect of targeted management is described by Richard Moyse (2013)[239], from which much of the following account is drawn – overall, plant numbers at Ranscombe reached over three million in 2012.



Kitchen Field, Ranscombe Farm – habitat. Photo by Lliam Rooney, 24 July 2012

The classic location at Ranscombe has been Kitchen Field (TQ 698 681), which stretches across a valley on chalk providing north- and south-facing aspects. This is an SSSI and carries an exceptionally rich arable weed flora, including *Agrostemma githago* (Corncockle), *Ajuga chamaepitys* (Ground-pine), *Lysimachia foemina* (Blue Pimpernel) *Anthemis cotula* (Stinking Chamomile), *Euphorbia exigua*, (Dwarf spurge), *Malva setigera* (Hairy Mallow) and *Roemeria argemone* (Prickly Poppy) – all Kent rare plant register species. Population totals for the Broad-leaved Cudweed up to 2005 relate to this field. Although limited fertiliser and herbicide applications were provided before, these were discontinued from this year, whilst crop sowing and minimum tillage continued, but with autumn tillage moved to spring over 2011-12. The consequence is that there has been no harvestable crop here at least for the period 2011-13, but the Broad-leaved Cudweed has flourished, with a total of 166,000 plants estimated in Kitchen Field in 2012.



Longhoes Field, Ranscombe Farm. Photo by Richard Moyse / Plantlife, July 2012

The management changes since 2005 have, as well as increasing plant numbers in Kitchen Field, seen the expansion of the species to other locations at Ranscombe where not noted before. Longhoes Field (TQ 715 673) has a southern exposure on chalk and was provided with an uncropped margin from 2005, in which *F. pyramidata* soon appeared for the first time. With cultivation being changed to a similar regime as for Kitchen Field, the population has expanded dramatically and while distribution has been patchy overall, plants have at times been so dense as to reach 400 in a quadrat of just 0.5 x 0.5 metres. The estimated total for this field in 2012 was 3,040,000 plants.[240]

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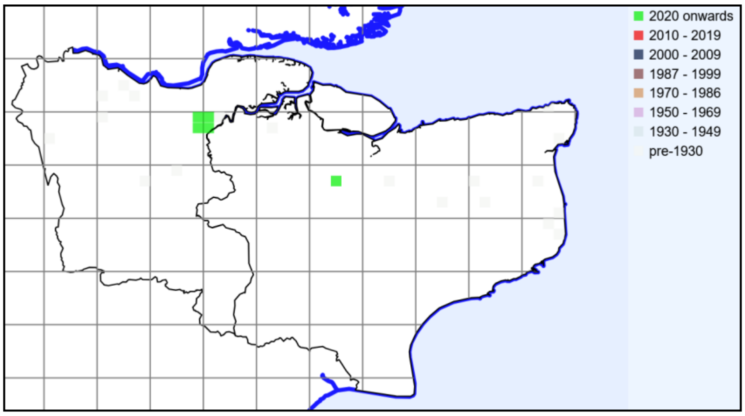
[239] R.J. Moyse. Response of broad-leaved cudweed *Filago pyramidata* to cultivation under Environmental Stewardship at Ranscombe Farm Reserve, Kent, UK: *Conservation Evidence* (2013) **10**, 72-76.

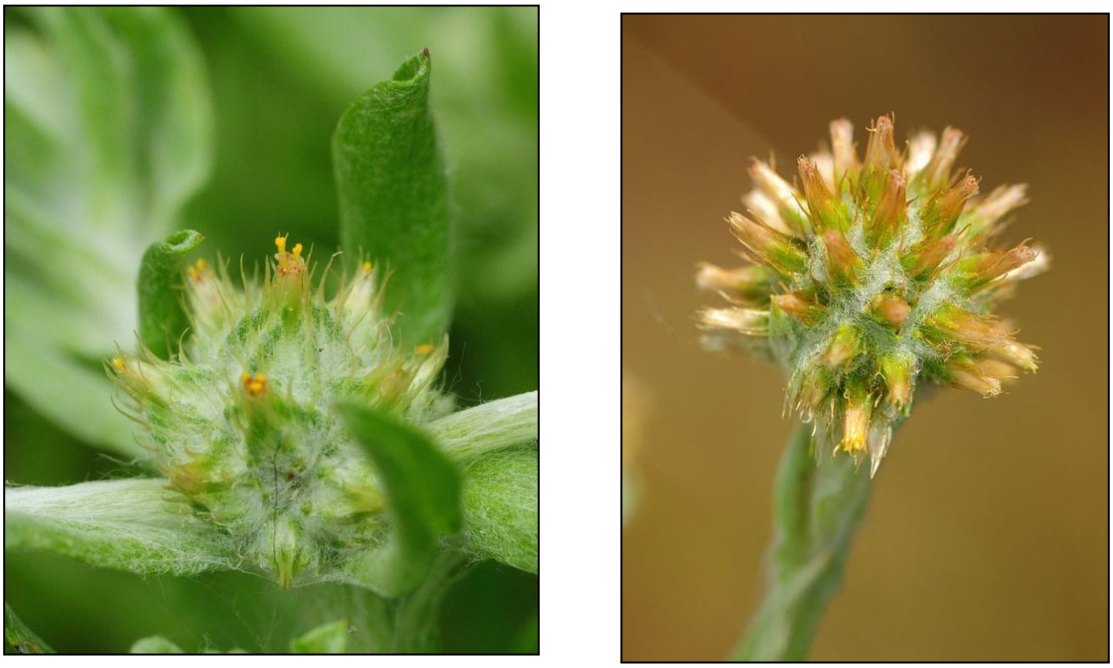
[240] Numbers are not always as extensive as this, and data for July 2020 provided an estimate of 12,000 plants (based on quadrat survey) for the northern part of Kitchen Field (in both TQ6967 and TQ6968); 90 plants in a chalky scrape at Clary Field, TQ 710 679; c.4,250 plants in a quadrat survey of Longhoes Field margin; and c. 1,450 plants in 28m x 3m of The Valley, TQ7067.

Additionally, plants have been found in Twenty Acre Field (in the margin from 2006, with thousands of plants present in 2012 along a 450m headland, TQ 699 679 to TQ 703 679) and along 75m of a headland (TQ 705 674 to TQ 705 675) where there were dozens of plants in 2012. Individual plants or small groups of plants have also been seen in open woodland and on an arable margin north of Longhoes Field, in a ride above Great Wood (TQ 705 686, 2011), and in an experimental chalk 'scrape' created within grassland in the south-west of the reserve (TQ 692 675, over 500 m from the nearest known population).



***Filago pyramidata* Kent records to 2024 mapped at tetrad level, from BSBI database.**

It seems likely that the rapid appearance of substantial numbers of plants in areas such as Twenty Acre Field and Longhoes Field derives from buried seed. Although there appear to be no earlier records which specifically indicate those localities, there is a 1970 record by Eric Philp for TQ7067 which could be for either of these, but in any event would lie outside Kitchen Field. However, the other, relatively small-scale occurrences suggest recent accidental transmission from the main populations. Further evidence of the potential for accidental movement is given by a 2010 record at Crutches Lane, Rochester (TQ7069) where about 100 plants were seen on a residential driveway. The occupier considered it to have been present for about six years and spreading rapidly; he believed that it may have been a consequence of regularly walking his dog at Ranscombe Farm. This was followed in 2023 by its discovery in Doddington churchyard, some 25km distant from Ranscombe, but frequented by regular monitors of the Ranscombe population.



Photos by Lliam Rooney. Left, *Filago pyramidata* with subtending leaves overtopping flower head cluster. Right, *Filago germanica* with subtending leaves below top of cluster and with more capitula making up the cluster.

Recent records indicate that numbers are not always in the enormous quantities observed earlier but are now spread over four monads at Ranscombe. In 2020, c.12,000 plants (estimated from quadrat survey) were recorded in TQ6967 and TQ6967 in the northern part of Kitchen Field; in TQ7067, 90 plants were seen in a chalky scrape in Clary Field, and 1,450 plants occupying an area of c.28m x 3m in The Valley; and in TQ7167 there were c.4,250 plants (estimated from quadrat survey) in the upper 10m-wide margin of Longhoes Field.

Filago pyramidata is a species of nutrient-poor, well-drained and disturbed terrain. In Kent, these preferences are met by its presence in thin soil over chalk in, or at the edge of arable, preferably unfertilised so as to reduce competitive growth. It is an annual, cited as having a peak for germination between October and December, but with a smaller peak in March; the overwintering plants may become many-branched, whilst the spring plants may be a tenth of the size, with a single flowering head. Ploughing Kitchen Field in spring 2012, rather than autumn 2011, however, did not prevent a substantial population arising during 2012 and Joyce Pitt[241] regarded it as in Kent primarily germinating during spring to early summer.

Broad-leaved Cudweed is a whitish-grey-haired annual, sometimes confused with *Filago germanica* (Common Cudweed). The former, however, is generally more sprawling (rather than erect); has main stems leaves widest above the middle (whereas *F. germanica* leaves are widest below the middle, or oblong); and has leaves around the main flower head cluster of which one or more overtop it (not overtopped at all in *F. germanica*). *F. pyramidata* also usually has less capitula per cluster: (5)10-20(25), as against (15)20-c.40 in *F. germanica.*

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[241] J. Pitt, Vascular Plants, in *The Kent red data book: a provisional guide to the rare and threatened flora and fauna of Kent,* ed. A. Waite (2000).

Fragaria vesca L. (Wild Strawberry)

vc 15 and 16

Rarity / scarcity status

Wild Strawberry is common throughout the British Isles and its conservation status in Great Britain is regarded as of 'Least Concern'. Whilst it is also common in England alone, there is sufficient evidence of decline that it is now treated as being **Near Threatened** (albeit that *Plant Atlas 2020* says that its overall distribution has changed little since the 1960s) . A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 29% in the likelihood of recording the species. Similarly, in Kent it is a frequent plant, indeed it is the commonest in the rare plant register, but between the county surveys of 1971-80 and 1991-2005 there has been a fall of 23% in the number of tetrads in which it is recorded (but 16% if measured to 2010-24 – see below).

Plaxtol. Photo by Lliam Rooney, 13 May 2012

Account

Wild Strawberry is known as a dietary item in mediaeval Kent, the remains having been found in an 11th century cesspit at Canterbury[242]. What may have been its remains (determined as 'strawberry/cinquefoil') were also discovered in the excavation of Roman pits at Maidstone[243]. The first published record of *Fragaria vesca* in Kent, however, was made by Thomas Johnson on 13 July 1629 (Iter Plantarum, 1629), who saw it by the main road between Gravesend and Rochester. He also encountered it on his second Kentish Journey, in 1632, in Thanet (*Descriptio Itineris*, 1632). The earlier botanists have little to say about the species in Kent other than along the lines of '*In Woods – very common*' (Edward Jacobs, *Plantae Favershamienses*, 1777), or 'Common in all the woods and lane' (Thomas Forster, *Flora Tonbrigensis*, 1816). Hanbury & Marshall (1899) considered it common in suitable situations (woods and banks) throughout the county. And so it remained up to the 1971-80 county survey (Philp, 1982), when *Fragaria vesca* was to be found in woods, scrub, chalk downland and roadside banks in 603 tetrads across the administrative county, i.e. 58% of all tetrads (and part tetrads). Those areas where the species was thin on the ground comprised Grain, Sheppey, the grazing marshes and other low ground of North Kent, Thanet, the Low Weald and Romney Marsh.

Court Wood. Photo by Lliam Rooney, 8 June 2005

By the time of the 1991-2005 survey (Philp, 2010), however, Wild Strawberry was still regarded as frequent, except in coastal marshes and other wet areas, but had reduced to 466 tetrads, so that the species was now only known in 45% of all tetrads (and part tetrads) in the administrative county. This still indicates a common plant; but the rate of decline is concerning.

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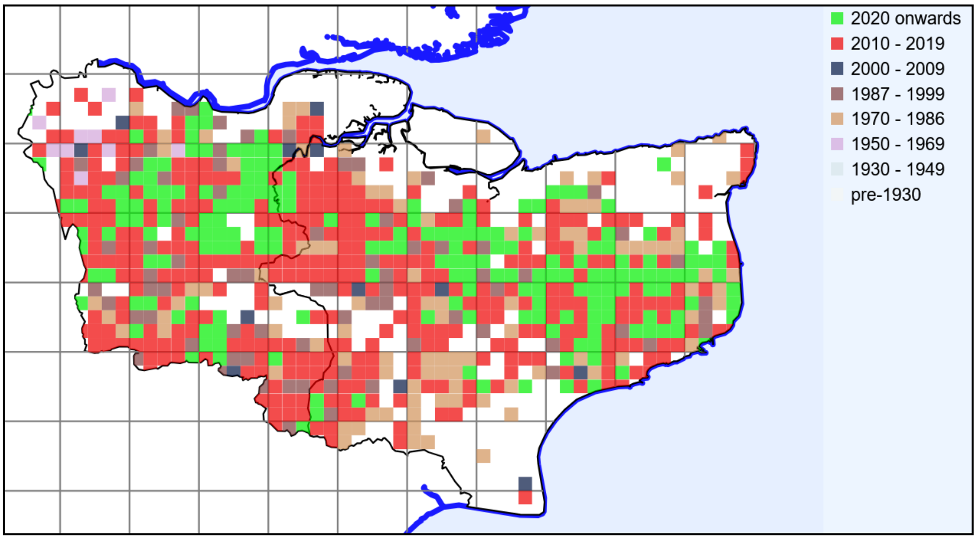
[242] M.G. & A. Hicks (2001). St Gregory's Priory, Northgate, Canterbury: excavations 1988-1991.

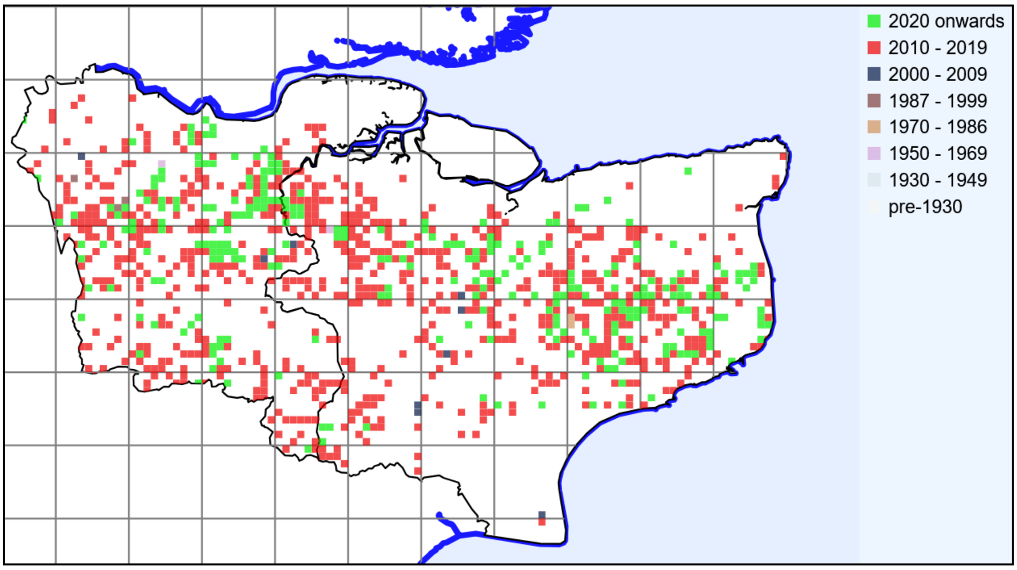
[243] C. Edwards (2007). Excavations at Fremlin Walk, Maidstone. *Archaeologia Cantiana* **127:** 73-106

The cause is not obvious. The plant's habitat preferences are reasonably wide; it is, in the British Isles, not at the outer range of its distribution such as might give rise to sensitivities to climate change. It seems least common in the more treeless areas – Sheppey, the north Kent marshes and Romney Marsh. However, our 2010-24 data indicate that the earlier decline may have been overstated, as recorded sites in this period amounted to 540 tetrads (949 monads). Comparing this period with the 1970s records, and discounting recent Greater London records which were outside the scope of earlier surveys, the decline to the present is 16%. The locations of losses are given in the tetrad distribution map below. They are fairly widely scattered, perhaps more at the margins of distribution, especially if one treats the Low Weald as carrying a marginal distribution.



***Fragaria vesca* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The following distribution map gives a more nuanced picture of current records. Being focussed at monad level, it not only gives the full set of recent records, because these are recorded to the relevant monad, but it also has few older records, as monad recording only became the norm in Kent from 2010.



***Fragaria vesca* Kent records to 2024 mapped at monad level, from BSBI database.**

Fragaria vesca is a perennial, sending out long, arching stolons which root so as to result in an expanding patch of the plant. It also spread by seed; the strawberries may be dispersed by birds. It is shade-tolerant, but may often be found at the edge of a hedge or wood where it is lighter. On steep roadbanks it is favoured by highway cutting which prevents coarser vegetation or shrub development from dominating.

It may be confused with *Potentilla sterilis* (Barren Strawberry), which occupies similar habitats, but which has the terminal tooth of its leaflets shorter than the adjoining teeth, sepals clearly visible between the petals, and flowers which are smaller than those of Wild Strawberry. Escaped *Fragaria ananassa* (Garden Strawberry) is larger in all its parts (flowers 20-35mm across v. 10-20mm). *Fragaria moschata* (Hautbois Strawberry) also tends to be larger, but with an overlap in flower size (15-30mm across); its uppermost pedicels have spreading or reflexed hairs whilst those of *Fragaria vesca* are appressed or ascending.

There are forms of *Fragaria vesca* grown in gardens and so potentially capable of escaping: forma *roseiflora* with pink petals; forma *alba* with white fruits; and forma *semperflorens*, which flowers and fruits throughout the year. The usual wild form, forma *vesca*, may also be found as a garden plant and has long been cultivated as such and can escape: suburban records are often of this status.

Yockletts Bank. Photo by Lliam Rooney, 21 May 2009

Frankenia laevis L. (Sea-heath)

vc 15

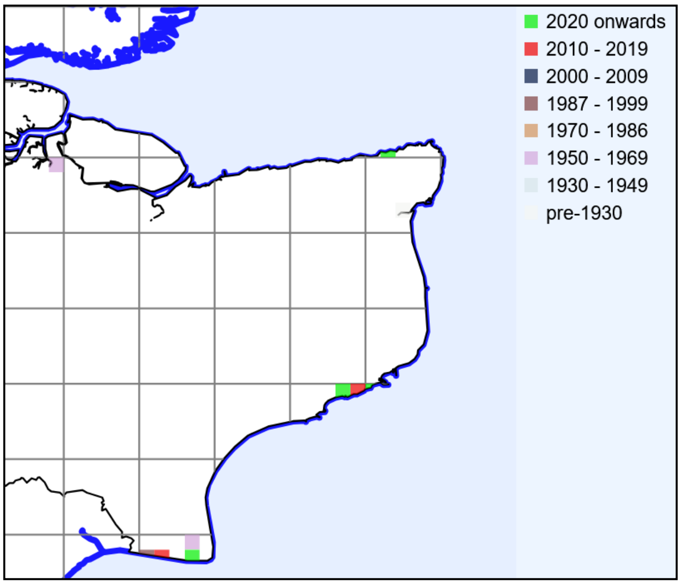
Rarity / scarcity status

Sea-heath is a coastal plant known from the Channel Islands and south east England, extending to Lincolnshire. Scattered records further west in England and Wales are considered likely to be of planted origins, including escapes from rock gardens, and one of the Kent sites (Margate) is of similar origins. It is considered to be **Near Threatened** in both England and Great Britain as a whole, although much of its decline may be historic,associated with coastal development and the construction of sea defences. In Kent, it is **scarce**. It is a Kent axiophyte, indicative of good habitat.

Pen Bars. Photo by Sue Buckingham, 20 August 2011

Account

The earliest published record for Kent is by William Hudson in his *Flora Anglica* (1762), where he accounted for it as found plentifully in the Isle of Sheppey. In the second edition (1778), Thanet was added as a location. By the time of Hanbury & Marshall (1899), it was regarded as very local, with a scattering of current records along the east coast from Pegwell Bay down to New Romney. There has been long continuity for some of these east coast locations. Gerard Smith knew it upon moist chalk-cliffs near Lydden Spout (*A Catalogue of Rare or Remarkable Phaenogamous Plants, collected in South Kent*, 1829); this was still at the foot of the cliffs there for Francis Rose in 1945 and regarded as abundant by Philp (2010). Francis Rose considered it to be a native of sandy or shingly salt marshes, above normal spring tide level at the base of chalk cliffs within reach of salt spray: extinct in north and north east Kent, and very rare elsewhere. The species remains one of very limited presence in the county; Philp (2010) gave it in five tetrads, our 2010-24 records are for six tetrads (eight monads), albeit that the Thanet plants appear to be escapes from plantings.



Frankenia laevis **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Frankenia laevis may be found in Kent in two main types of habitat. One is bare or semi-bare, damp, saline ground, generally free-draining sand/shingle, which can be at the upper level in transition to saltmarsh. The association of this species in such a habitat with *Suaeda vera* at Lydd Ranges is paralleled by the situation at Blakeney, Scolt Head Island, Burnham Overy

Staithe and Brancaster (all Norfolk) noted by Brightmore (1979)[244]. This type of habitat formerly harboured *Frankenia* in north Kent , e.g. at Faversham Creek and Sheppey (last recorded on the island in 1863, by John Stuart Mill).

The other type of habitat is on or at the foot of sea cliffs. The presence of the species in an undercliff community (as at Abbot's Cliff) is remarked by Brightmore (1979) as in Britain only to be found between Dover and Folkestone, and then had been adversely affected by cliff falls and sea defence works. The presence of the species on the cliffs themselves was studied by Martin Newcombe (1991[245]), which involved being lowered over the edge of Abbot's Cliff. *Frankenia* was found over an area of about 0.1 hectare, in exposed places being frequently the only species present. Its main associates were *Thymus pulegioides* (Large Thyme) and *Sedum album* (White Stonecrop), both also plants with an ability to exploit bare, soil-less terrain. Other species present included *Blackstonia perfoliata* (Yellow-wort), *Brassica oleracea* (Wild Cabbage), *Centaurium erythraea* (Common Centaury), *Echium vulgare* (Viper's-bugloss*)* *Helianthemum nummularium* (Common Rock-rose) and *Limonium binervosum* (Rock Sea-lavender). *Rubia peregrina* (Wild Madder) was found on a subsequent visit.

Sea-heath is a mat-forming perennial anchored by a strong taproot, bearing evergreen leaves with glands from which salt may be excreted. It is not readily confusable with other species.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Lydd Ranges	TR01D		30 May 1993	EGP & JBe (Philp, 2010)	In Philp (2010): a few plants on the edges of saline pools. *In litt*: a small colony with *Suaeda vera* with two or three plants found in saltmarsh in the administrative county of Kent (but both sides of county border are in vc15).
Lydd Ranges	TR01I	SSSI	(1) 7 August 2017 (2) 30 May 1993	(1) BBe (2) EGP & JBe (Philp, 2010)	(1) TR 03460 17240, small patch, Wickmaryholme. (2) In Philp (2010): a few plants on the edges of saline pools. *In litt*: flourishing with many healthy plants on bare ground at the north side of Wickmaryholm Pit, although part of site had been destroyed by building up and widening sea wall. Known at the Wicks, 1946, FR.
Dungeness, Pen Bars	TR0616	SSSI	(1) 20 August 2024 (2) 20 August 2011 (3) 2007 (4) 27 June 1996	(1) AL & RD (2) SB (3) RG (4) EGP (Philp, 2010)	(1) TR 0647 1681. Denge Beach. (2) Abundant on sand and shingle in sea seepage gully from TR 06403 16978 to TR 06503 16772. (3) TR 065 167. (4) Recorded as at TR01T, in good quantity on shingle at Pen Bars. Known by FR as plentiful in a saline shingle low by the Hope & Anchor, 1945-59 (this was near Pen Bars).
Capel –le-Ferne	TR2638	SSSI	14 June 2021	SB	A small spread of plants over 2m x 1m of bare chalk at TR 26947 38488 at base of cliff and within reach of sea spray.
Abbot's Cliff	TR2738	SSSI	(1) 30 September 2013 (2) 11 July 1990	(1) SB (2) MN	(1)Western margin of brackish pool at base of Abbot's Cliff. Spread of plants 20 x 2 metres at TR 27555 38518 and smaller area at eastern margin at TR 27609 38514. (2)At TR 276 386, 200-250 plants over about 0.1 hectare on level

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[244] D. Brightmore. Frankenia laevis L. Biological Flora of the British Isles. *J. Ecol*. (1979) **67**: 1097-1107.

[245] M. Newcombe. Sea Heath and other plants on a degraded cliff face. *Transactions of the Kent Field Club* (1991) **11**: 93.

					terraces along cliff face (accessed by abseiling). Also visited by EGP on 22 July 1990. Recorded at Abbot's Cliff by FR 1947-60.
Samphire Hoe	TR2838	SSSI	(1) 27 January 2014 (2) 9 July 2013	(1) PHo (2) CO	(1) Two plants on front edge of Hoe above fenced concrete slope and near pool, c. TR 2875 3871, possibly derived from original sowing or planting on the area[246]. (2) Apparently a different site - one patch about 2 ft. sq, located 5-10 metres up the side of chalk cliffs between Samphire Hoe and beachside house, *c*. TR 282 387.
Dover, Shakespeare Cliff	TR3039	SSSI	(1) 23 July 2023 (2) 22 July 2010 (3) After 1990, before 2006 (4) 26 May 1988	(1) SC (2) SC (3) EGP (Philp, 2010) (4) EGP	(1) 25 large mats and many small plants from TR 30788 39858 to TR 30810 39933, increasing. (2) Five clumps. (3) Recorded as at TR33E, a few plants on the chalk cliffs. (4) TR 303 395. Also recorded here on dry chalk rubble of undercliff by FR 1958-63 and by P. Moring in 1904 (**BM**).
Margate	TR3270, TR3370	SSSI	(1) 22 July 2021 (2) 9 July 2018 (3) 19 May 2015 (4) 23 June 2011 (5) 2 January 2011	(1) CO (2) JG (3) CO (4) SB (5) SB	(1) Still spreading out from original ornamental planting. (2) TR3270, on chalk cliff face. (3)(a) On cliffs below ornamental planting, TR3270, as previously recorded. (b) One plant on promenade by road down from cliff-top at c. TR 330 700. (4) Well-established for 15m on low chalk cliff TR 32972 70512, escaped from flower bed on cliff top; similarly escaped at TR 3295 7050. (5) TR 32961 70512 many plants on low chalk cliffs above promenade, probably at least 30m.

Abbot's Cliff, habitat (plant grows on margin above green algae at end of pool). Photo by Sue Buckingham, 30 September 2013

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[246] A small number of plants was apparently grown on from seed deriving from the Abbot's Cliff site, for planting out at Samphire Hoe, according to Kershaw, K.R., Helliwell, D.R. & Warren, C.D., Ecological and environmental geology, in (eds.) Harris, C.S., Hart, M.B., Varley, P.M. & Warren C.D. (1996) *Engineering Geology of the Channel Tunnel.*

Fumaria bastardii Boreau (Tall Ramping-fumitory)

vc 15, long gone from vc 16

Rarity / scarcity status

Fumaria bastardii is primarily an agricultural weed not uncommon in Britain and Ireland, except for the south east and midlands, from which it is virtually absent. In England and in Great Britain as a whole its conservation status is regarded as of 'Least Concern'. In Kent, it has appeared several times recently after a long absence., but not as an agricultural weed. It is difficult to assess how far these may yet be casual appearances, but some are of small populations, which may indicate potential for continuity, and there has been presence in 14 tetrads (15 monads) since 2010, all in East Kent. The local status of the species is now re-assessed from formerly rare to verging on **scarce**. It is being retained on the register in order to encourage continued recording and to test whether its increased occurrence is not a temporary phenomenon.

Account

The Tall Ramping-fumitory has always been unusual in Kent. The first publication of its presence in the county was in Hanbury & Marshall (1899) under the name of *Fumaria confusa.* Marshall had found it at Kennardington; Hanbury had seen it between Bidborough and Speldhurst and between Mockbeggar and Yalding; and F.M.Webb (a botanist who was mostly involved with the flora of the Liverpool area and who died in 1880) was credited as the first finder, with discoveries near Ashford and Harbledown. However, all these finds are likely to have been preceded by an 1854 specimen from Kits Coty near Maidstone which was identified as this species by Pugsley (1912)[247] as then in the herbarium of the late Frederick Townsend (now **SLBI**).

Westbere. Photo by Colin Osborne, 18 June 2015

It has, however, been little seen since until relatively recently. A plant claimed near Canterbury in 1912 may not be this species; but Francis Rose found it in 1948 in hospital grounds at Coxheath and it was in this area that Dr Cyril West also recorded it, in the 1950s. Then, after an absence of record, on 7 September 2011 a fumitory was found by members of the Sussex Botanical Recording Society which was determined as this species by Rose Murphy, the BSBI referee. The discovery was written up as 'Return of *Fumaria bastardii* to Sussex' in *BSBI News* (2012) 119:39. Whilst it was claimed for Sussex as part of recording in vc14, the map reference given (TQ 9918 1818) is in the administrative county of East Sussex, but for botanical recording purposes is in vc15, East Kent. The position is complicated in that the fumitory could not be found when Kent botanists visited the site in 2012, and the map reference appeared to be incorrect. Upon enquiry it seems that the plant was originally found somewhat south of the published location, in the near vicinity of a group of coastal properties, Jury's Gap House and Jury's Gap Coastguard Cottages. The published location is about 250m Kent-wards of the vice county boundary and the actual location is understood to be about 300m inside East Kent. The site was re-visited by Kent botanists in 2013, when it appeared that the flower bed in which it had originally been seen had been excavated and spread over other parts of the grounds, albeit that the fumitory had not reappeared in the process.

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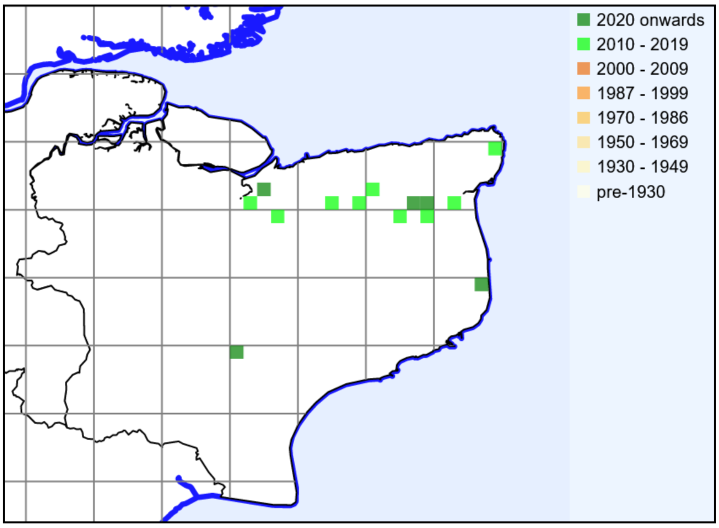
[247] H.W. Pugsley. The genus *Fumaria* L. in Britain. Supplement to the *Journal of Botany* (1912) vol. 50.

On 18 June 2015 a further plant was found by Colin Osborne, subsequently confirmed by Tim Rich from photographs, just within the railway fence by the former level crossing at Walnut Tree Lane, Westbere, TR 1965 6101. Its presence is perhaps associated with crossing closure works by Network Rail in the preceding year or so. Further investigation by Lliam Rooney (25 June 2015) revealed a small population, c.20 plants ranging from small and scraggy to robust, scattered by a footpath parallel to the railway, both within and outside railway land. *Fumaria muralis* (Common Ramping-fumitory) was also present.

Westbere, habitat. Photo by Colin Osborne, 18 June 2015

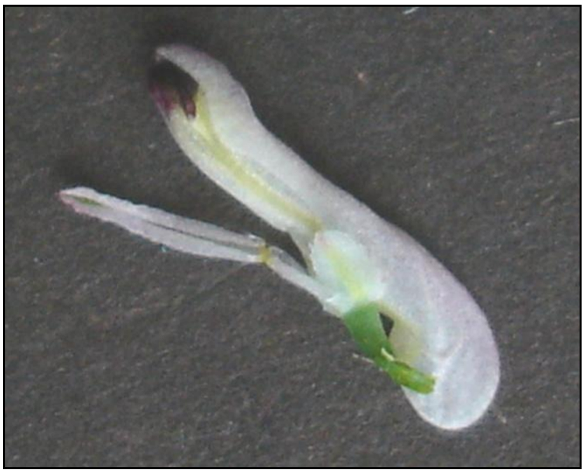
A colony was also discovered by Lliam Rooney at Graveney Road, Faversham on 10 October 2015. A very large plant was seen sprawling for 3m along the ground and up 1.5m into windbreak trees at TR 02910 61057; two small specimens were at TR 02979 61051; another very large fumitory grew at TR 02986 61052, spreading 2m x 1.5m up the fence with two or three small plants 0.5m away. Then there was a small collection of small plants scrambling along the ground and a swathe of larger plants in the hedge for 12m, the middle grid reference being TR 02999 61057 going into TR0361. Both Westbere and Faversham populations seem to have a reasonable expectation of continuance, although all fumitories require a degree of continued disturbance if not to remain as casuals.

Further scattered populations were found in 2017: by Sue Buckingham near Richborough, at TR 3341 6113, on sand by a fence off the A256; and at Ash (East Kent), TR 2984 5809, on a sandy roadside bank; and with Lliam Rooney near Tyler Hill, TR 1415 6103, on a sandy laneside. In 2018, Danny Chesterman found it in Broadstairs station car park, TR 39070 68039; and in 2019 at Boughton-under-Blean, a roadside plant 6 feet high, TR 061 584. 2019 also saw further finds by Sue Buckingham at a recreation area at Hersden, TR 2016 6206, and also beside a lane at TR 2097 6231. In 2020 it was discovered by Allan Ward in an alleyway near Kingsnorth, Ashford, TR 0058 3956, and by Sue Buckingham at a Kingsnorth roadside, TR 373 485. Danny Chesterman added a further site in 2022, a single plant under a hedgerow near Goodnestone, TR 04599 62753. It was also recorded in 2023 by Alan Lockton and Joumana Mobarak at Paramour Street / Westmarsh in front of houses (TR 279 612) and in a vegetable garden (TR 2804 6126).



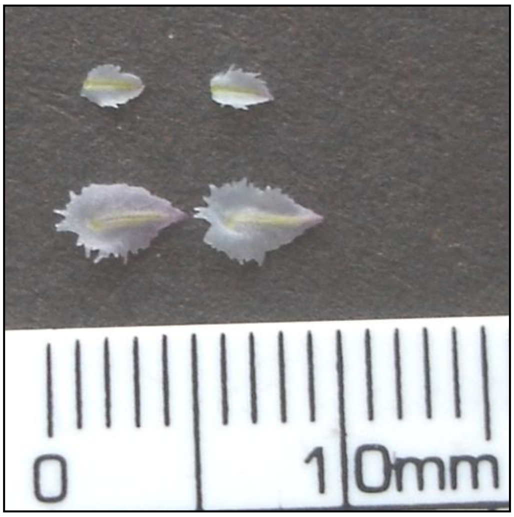
***Fumaria bastardii* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Tall Ramping-fumitory is elsewhere in Britain commonest on cultivated or other disturbed land, whereas in Kent it is not an agricultural weed, but more a plant of roadsides, hedges and railway land. It is a fairly large-flowered fumitory (the Westbere corollas measured 11mm) with small sepals (2 x 1.5mm for the Westbere plant) bearing jagged, forwardly-directed teeth. The commonest variety (var. *bastardii*) has salmon-pink flowers without any other colour markings, but the Westbere flowers were whitish, very pale pink, the key feature being that the upper petal is concolorous without a dark tip, and in this respect var.*bastardii* may be distinguished from all other British large-flowered fumitories.



From Westbere plant, showing small sepal and concolorous upper petal. Photo by Colin Osborne, 18 June 2015

From Westbere plant, showing small sepals above, compared with those below from nearby *Fumaria muralis* (Common Ramping-fumitory). Photo by Colin Osborne, 18 June 2015



Fumaria parviflora Lam. (Fine-leaved Fumitory)

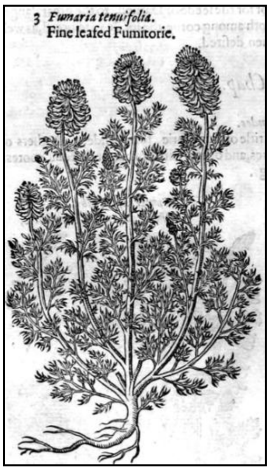
vc 15 and 16

Rarity / scarcity status

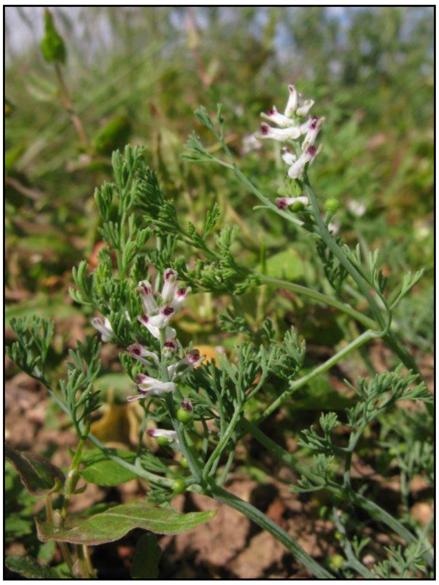
Fumaria parviflora is an ancient introduction, or archaeophyte, which is in the British Isles almost entirely restricted to arable fields on chalk. With other arable weeds, it has declined after the middle of the 20th century as a result of agricultural intensification, with herbicidal treatments and high fertiliser levels. This trend has led it to be regarded as **Vulnerable** in Great Britain and so at high risk of extinction in the wild, albeit that in England it is assessed only as **Near Threatened**. In Kent it was initially assessed as rare, based on the limited records in Philp (2010), but further recording indicates that it should be regarded as near **scarce**. It is a Kent axiophyte, indicative of good habitat.

Account

The first record in Kent is given by John Gerard in his *Herball* (1597), who tells us that 'I founde the [Fine-leaved fumitory] growing in a cornefielde between a small village called Charleton and Greenwich'. Hanbury & Marshall (1899) described the plant as to be found in chalky fields; rather rare, though usually abundant where it occurs. They listed a number of records across the county from Erith to Ramsgate with a concentration, it appears, in the Cobham / Cuxton area, which has remained a location for this species. Francis Rose recorded it extensively, always in its characteristic habitat: in a chalky field by Watling Street, Bishopsbourne (1946-48); in a chalk cornfield north east of Cuxton station (1951); west of Pitt Wood, in a chalky arable downland field (1955); in a cornfield on chalk east of Knowlton (1958); at Lad's Farm, Snodland, in a cornfield on chalk (1960); and half a mile north east of St Margaret's at Cliffe in arable on chalk at the cliff's edge (1962).

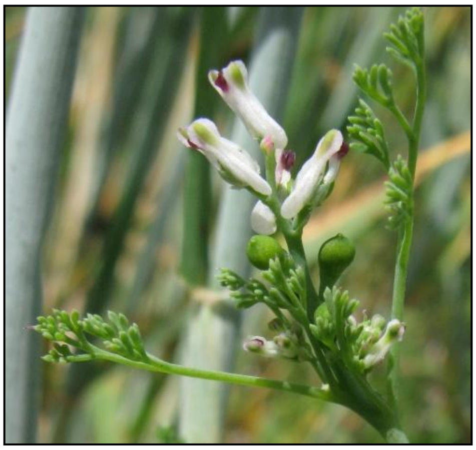

3 Fumaria tenuifolia.
Fine leafed Fumitorie.

From Gerard's Herball (1597)



Near Chillenden. Photo by Sue Buckingham, 26 June 2012

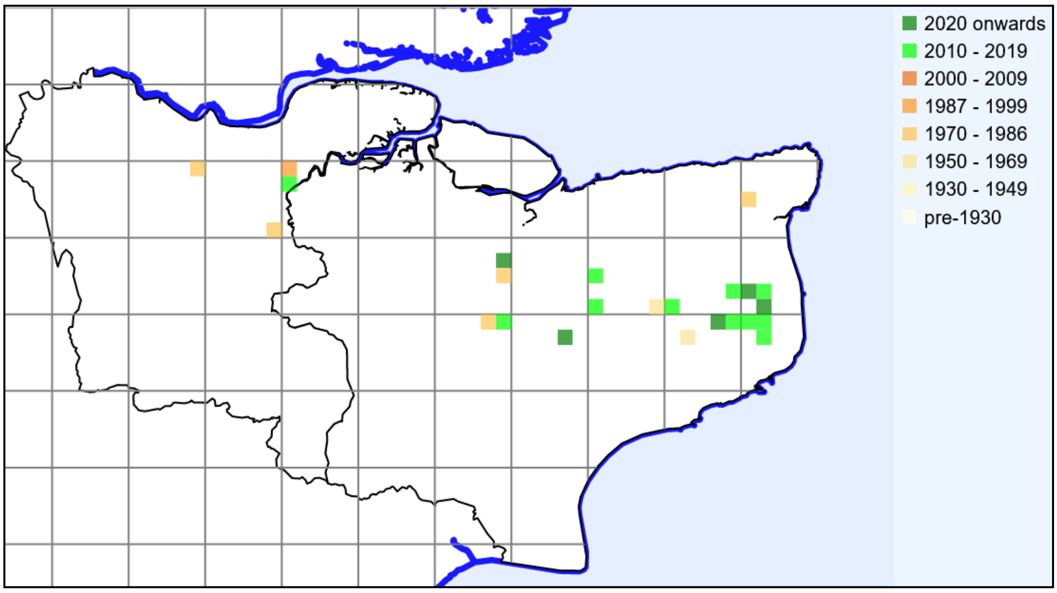
Philp (2010) considered Fine-leaved Fumitory to have declined in recent years, giving only three tetrad records (Cuxton and Westwell), whereas ten were given in Philp (1982). However, out of those ten tetrads recorded earlier, five were clustered inland of Walmer/Kingsdown, and more recent investigation has shown that the species still remains in this area, with finds made near East Studdall and Chillenden; so the assessment of decline needs to be taken with caution. Additionally, new locations have emerged since 2010, so that there are (2010-23) 16 recent tetrad records (17 monads), more than as recorded in the 1971-80 survey, but not necessarily the same tetrads. It is now almost entirely an East Kent plant (although in 2019 present in thousands at Ranscombe, West Kent).



Near Chartham. Photo by Sue Buckingham, 29 July 2013

Fumaria parviflora in Kent has been found associated with arable weeds also characteristic of chalky arable margins, such as *Anisantha sterilis* (Barren Brome), *Fallopia convolvulus* (Black-bindweed), *Papaver rhoeas* (Common Poppy), *Viola arvensis* (Field Pansy). It has also been recorded in conjunction with other fumitories: *Fumaria densiflora* (Dense-flowered Fumitory) and *Fumaria officinalis* (Common Fumitory). It may be distinguished from those species by its small (5-6mm) flowers and sepals (rarely more than 1mm long), but perhaps is most easily picked out by the whitish flower colour (unless going over), the other species being pink.

***Fumaria parviflora* Kent records to 2024 mapped at tetrad level, from BSBI database.**



See also the account for *Fumaria vaillantii* (Few-flowered Fumitory) for differences in relation to that species.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Longfield	TQ56Z		16 July 1979	JRP	Chalky arable field north of Pinden Farm. [Presumably TQ5969.] EGP also referred to it as seen in the 1970s from the NW-SW footpath in TQ5968. [Not found, 2012, GK – area was subject to extensive agricultural herbicide treatment.]
Snodland	TQ66V		After 1970, before 1981	Philp (1982)	
Detling/Boxley	TQ75Z		1981-90	EGP	Taken from EGP's card index.
Cuxton (Ranscombe)	TQ76D & 76E	Owned by Plantlife and Medway Council, and managed with regard to arable weed flora	(1) 18 July 2019 (2) 5 June 2014 (3) 19 June & 9 July 2013 (4) After 1990, before 2006	(1) (2) & (3) RM (3) EGP (Philp, 2010)	(1) TQ7167. An exceptional year. While only present in Longhoes Field (centred on TQ 714 672), there were thousands of plants distributed right across the field. (2) TQ 715 673. Longhoes Field. (3) Six plants found in June at TQ7162 6736, in Longhoes Field, Ranscombe Farm, near the car park. Two more nearby, around TQ 7142 6730 in July. (Also seen by JA, 28 June 2013 at TQ 71415 673170). (4) Tetrad references only given.
Westwell-Charing	TQ94U		After 1970, before 1981	Philp (1982)	
Westwell	TQ9848		29 August 2013	JLa	Westwell Down, TQ 9813 4808, in

					wheatfield on one side of which sweet corn had been planted in July or early Aug, so disturbing the ground from which the *Fumaria* emerged. This monad is the location for the record given (erroneously) as TQ94E Westwell in Philp (2010). It was found just below the North Downs Way, probably around TQ9897 4801. [Not located 2012, when field under rape and heavily sprayed, GK.]
Throwley	TQ95X		After 1970, before 1981	Philp (1982)	TR 063 466. Six plants on track between arable fields with Common Fumitory.
Wilgate Green	TQ9956		(1) 24 April 2020 (2) 31 May 2019 (3) 16 July 2018 (4) 9 June 2016	(1) DCh (2), (3) & (4) AW	(1) TQ 996 562, *c.*20 flowering plants in arable margin with *Fumaria officinalis.* (2), (3) & (4) TQ 995 563, arable field.
East of Wye	TR0646		19 June 2022	DCh	
Chartham	TR1054		29 July 2013	SB	Nine plants in arable on chalk at TR 108 541 amongst thinly sown barley. Private farmland under High Level Stewardship scheme benefiting notable arable plants.
Chartham	TR15H		1981-90	EGP	Taken from EGP's card index.
West of Petham	TR1150		16 May 2015	SB	A single flowering plant at TR 11293 50839 in unsprayed top corner of arable field. Field sown with wheat crop.
Kingston	TR2051		30 July 2013	SB	Ileden Farm, two plants in arable margin at TR205 518, edge of barley field.
Shepherdswell east	TR2648		5 June 2023	SC & ML	On crop-edge TR 26891 49340.
Near Chillenden	TR2852		26 June 2012	SB	Four plants at margin of Flax crop on chalk at TR 28934 52131, spaced out along 30 metres with *Fallopia convolvulus*, *Anisantha sterilis*, *Viola arvensis.* One plant at TR28960 52403 in margin of flax crop on chalk with *F. densiflora, Anisantha sterilis.* May be same location as TR25W, recorded in Philp (1982).
Malmains Farm	TR2949, TR3049		6 July 2017	KBRG meeting	Thousands of plants spread over a 100 metre wide x 1 kilometre long arable margin on shallow chalk soil from around TR299 490 to TR303 498. Malmains Farm was operating a stewardship scheme with Natural England and the plot was drilled with a grass/brassica mixture and left unsprayed.
Betteshanger	TR3152		30 June 2023	SC	Frequent in conservation field e.g. TR 31830 52366.
East of West Langdon	TR3247		4 July 2017	SC &ML	
Ashley - Studdal	TR34E		After 1970, before 1981	Philp (1982)	[Not found, 2012, SB – search focused on TR 317 489 where recorded in 1962 and now heavily sprayed.]
East Studdal	TR3249		(1) 23 June 2016 (2) 29 June 2011	(1) KBRG meeting (2) SB	(1) A few scattered plants alongside the margin of a wheat field at TR 3266 4998. (2) TR 32320 49969, one large sprawling plant, arable field margin on chalk.

					May be same location as TR34J, recorded in Philp (1982).
Betteshanger	TR35B		After 1970, before 1981	Philp (1982)	[Not found 2012, SB, area being intensively farmed.]
East Studdal	TQ3250		(1) 11 May 2023 (2) 23 June 2016 (2)29 June 2011	(1) SB (2) KBRG meeting (2) SB	(1) Still present in same location on Northbourne Road at TR 32601 50024. A good number of plants this year and some flowering. (2) A considerable number of plants on both sides of Northbourne Road from TR 32600 50026, westwards to TR 32397 50191. These plants on the narrow margin of a wheat crop with *Fumaria officinalis and* F. densiflora. At TR 3260 5005 on a gigantic manure heap, sealed with an ash layer were many more plants of *F. parviflora* also with *Papaver hybridum*. (2) TR 32587 50039, 10 plants at margin of arable field on chalk, north side of road. TR 32605 50018, some six sprawling plants at margin of arable field on chalk, south side of road. May be same location as TR35F, recorded in Philp (1982).
Minster (Thanet)	TR36C		After 1970, before 1981	Philp (1982)	
Northbourne	TR3352		20 August 2014	SB	Four very large spreading plants at margin of wheat crop on chalk at TR 33530 52378 and alongside the footpath across it at TR 33531 52392 on Northbourne Court estate. Associated arable species: *Fumaria densiflora, Viola arvensis, Sherardia arvensis*.

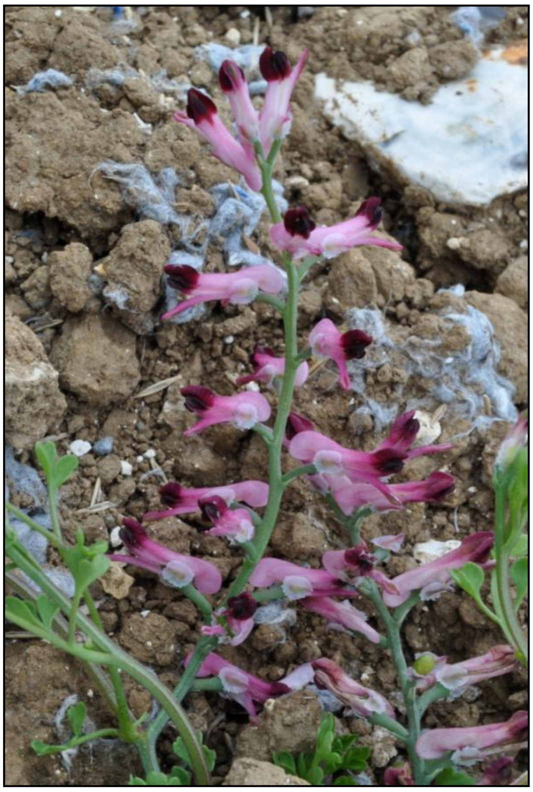
Near Chillenden, habitat. Photos by Sue Buckingham, 26 June 2012

Fumaria reuteri Boiss. (Martin's Ramping-fumitory)

vc 15

Rarity / scarcity status

The status of *Fumaria reuteri* in the British Isles is to a degree uncertain, as to whether it is a native (as has long been maintained), an archaeophyte (an ancient introduction) or a relatively recent introduction, the first record being in 1904. It has been treated as nationally rare but apparently is no longer so. Somewhat surprisingly, it is protected from picking and sale under the Wildlife and Countryside Act 1981 as amended. Its conservation status is treated as of 'Least Concern' in England and Great Britain as a whole and its recorded distribution has until recently been essentially southern, and it shrank in the 1980s to Cornwall and the Isle of Wight. From 2006 onwards, however, there have been several widely scattered new finds: as well as additional sites in the Isle of Wight, it has been found in garden ground, a raised hedgebank and a potato field in Scotland (2006-09); a raised plant bed in Surrey (2010); on allotments and in a turnip field in Hampshire (2010-11); and on a guided bus route in Cambridge (2012). There is no obvious common factor which might suggest a particular means of introduction; the relationship with disturbed ground being a characteristic of fumitories generally. In Kent, *Fumaria reuteri* is likely to have been introduced, in a limited area where evidence of persistence is lacking, and is regarded as very **rare**, if not extinct. It may well be that it should be regarded as no more than briefly casual and not warranting register status.



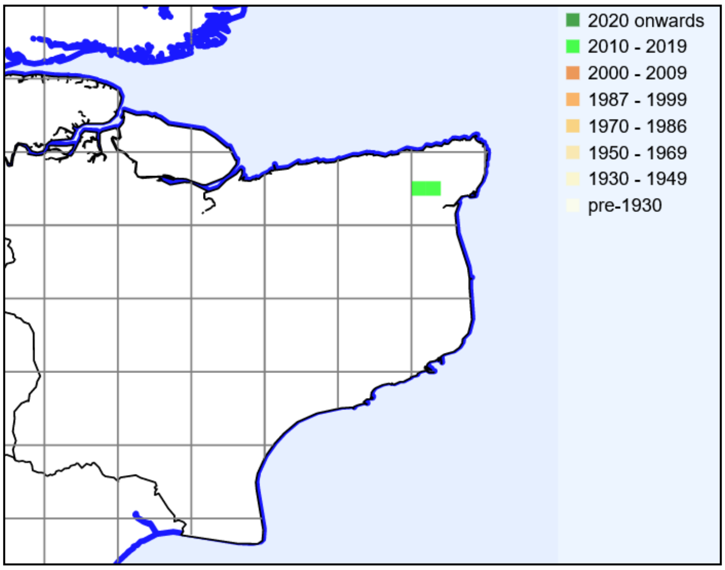
A229. Photo by Brian Laney, June 2011

Account

There are no historic records for Martin's Ramping-fumitory in Kent. In June 2011, several sites associated with roadworks in relation to the improvement of the A299 near Manston airport were discovered by Brian Laney, whose determinations were confirmed by Rose Murphy (BSBI referee).

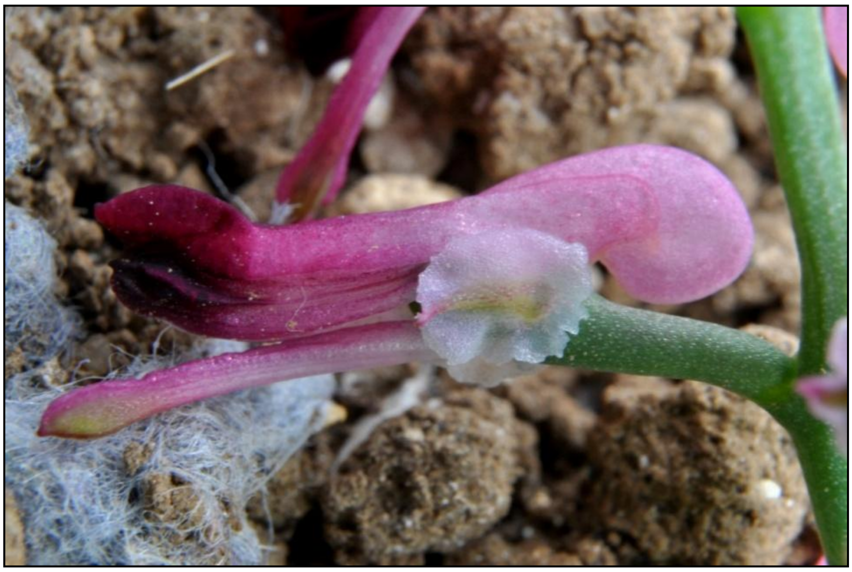
A229 roadworks, habitat. Photo by Geoffrey Kitchener, June 2011

It was first recorded on 11 June at TR 31173 65723, growing at the base of a south facing bank on the south side of the A299 by Mount Pleasant roundabout. Here was semi-bare ground, with the recently graded slope carrying its first germination of weeds such as *Chenopodium album* (Fat-hen), *Fumaria officinalis* (Common Fumitory), *Galium aparine* (Cleavers), *Mercurialis annua* (Annual Mercury), *Polygonum* *aviculare* agg (Knotgrass) and *Sonchus oleraceus* (Smooth Sow-thistle). On the same day the species was recorded on a south-facing road slope of the A299 at TR 32577 65513. At this location, the grass sown on the embankment had scarcely germinated by the end of the month, but there was an associated weed flora of *Chenopodium album, Galium aparine, Mercurialis annua, Papaver rhoeas* (Common Poppy), *Polygonum aviculare* agg, and *Sinapis arvensis* (Charlock). On 19 June 2011, the fumitory was also recorded by Brian Laney at TR 31986 65627, on a wide disturbed strip between airport and the north side of the A299.



Fumaria reuteri **Kent records to 2024 mapped at tetrad level, from BSBI database.**

The evidence points to *Fumaria reuteri* being amongst the first plants to germinate once the reconstructed road had been laid out and seeded. The likelihood is that there is an association with foreign seed (it is native also to France, Portugal and Spain), rather than disturbance of a seedbank from previously unrecognised occurrences. However, as introduction cannot be definitely demonstrated or ruled out, the species is being maintained on the county rare plant register for the time being. Its reoccurrence at the original locations is likely to rely upon further disturbance, once the grassing over of the highway slopes has thickened (which it had done by 2014). The seed bank is likely to be long-persistent – Wiggington (1999[248]) refers to cases of appearance following cultivation of fields which have been in permanent pasture for many years.



A229. Photo by Brian Laney, June 2011

Martin's Ramping-fumitory is an annual, most noticeable by virtue of the size of the flowers (11-13mm). Other distinctive characteristics are the recurving of the flowers, their rose-pink colour and blackish-red tips and almost entire sepals not more than 5mm long.

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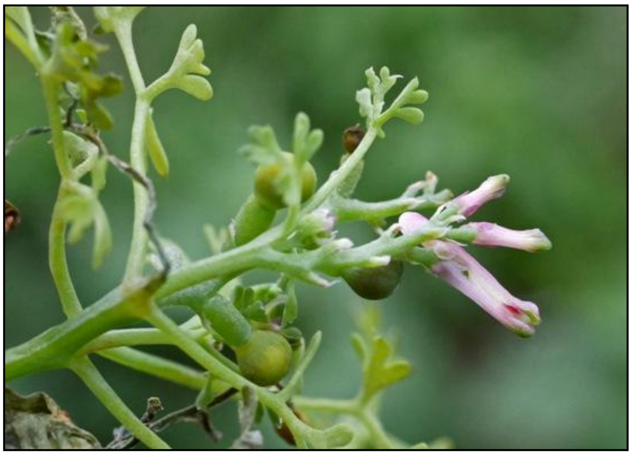
[248] Wiggingon, M.J. (1999). *Fumaria reuteri* Boiss. (Fumariaceae), in ed. Wiggington, M.J., *British Red Data Books 1 Vascular Plants*, JNCC, Peterborough.

Fumaria vaillantii Loisel. (Few-flowered Fumitory)

vc 15 and 16

Rarity / scarcity status

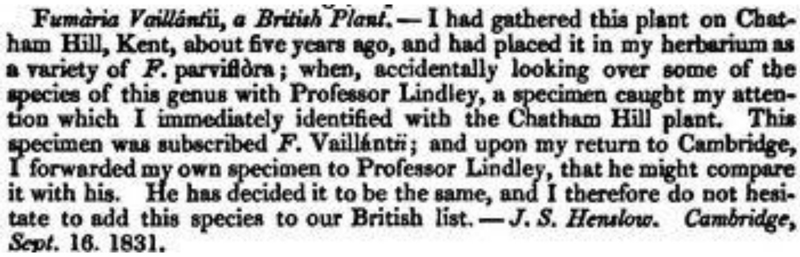
Fumaria vaillantii is a **nationally scarce** archaeophyte or ancient introduction, whose distribution in the British Isles is largely restricted to south east and south central England, where the species favours chalk arable. It is one of the rarest fumitories in the British Isles and appears to have declined since 1950 due to agricultural intensification. In consequence it is regarded in England and in Great Britain as a whole as **Endangered**. In Kent, it is a **rare** plant.



Hinxhill. Photo by David Steere, 23 August 2020

Account:

The Few-flowered Fumitory was first identified in the British Isles from Kent material by Professor John Henslow, in 1831. The species had been named in 1809 by Loiseleur-Deslongchamps, but British botanists had not recognised its presence until Henslow wrote in *The Magazine of Natural History* (1832):



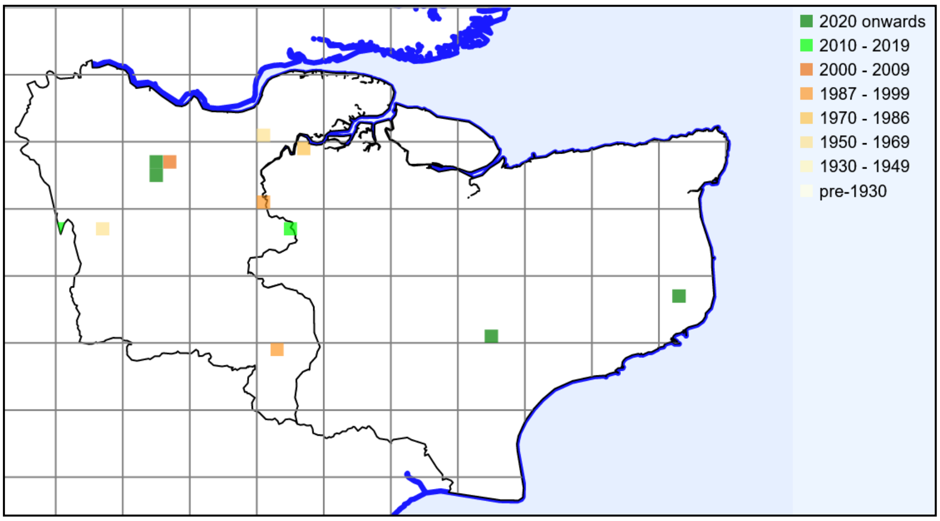
Fumària Vaillántii, a British Plant. — I had gathered this plant on Chatham Hill, Kent, about five years ago, and had placed it in my herbarium as a variety of *F.* parviflòra; when, accidentally looking over some of the species of this genus with Professor Lindley, a specimen caught my attention which I immediately identified with the Chatham Hill plant. This specimen was subscribed *F.* Vaillántii; and upon my return to Cambridge, I forwarded my own specimen to Professor Lindley, that he might compare it with his. He has decided it to be the same, and I therefore do not hesitate to add this species to our British list. — *J. S. Henslow. Cambridge, Sept.* 16. 1831.

Hanbury & Marshall (1899) regarded it as very rare, in chalky cornfields. They cited relatively few records and challenged a claim in *Flora Thanetensis* (1847). They did not include a possible specimen from Greenhithe gathered in 1860 which, when put to an expert a century later, elicited a response, 'Possibly...I would not commit myself to determination of such appalling material'.

Eynsford. Photo by Rodney Burton, 16 August 2020

Records remained sparse afterwards, although Francis Rose saw it in 1948 on chalky broken land at Morants Court Hill, along the same range of chalk downs as Brasted Hill, where Ray Clarke claimed it in 1972. Philp (1982) had only one confirmed record for the 1971-80 county survey, at Gillingham; and the 1991-2005 survey (Philp, 2010) lists only two records, one from a cornfield at Horton Kirby and the other from disturbed chalky soil near Snodland. This last record points to the potential for what is basically a rare chalk cornfield weed to appear, even more rarely, in a disturbed non-agricultural habitat. That is echoed by a 2012 find by Daphne Mills on ground disturbed by the construction of fencing around a new stadium for Maidstone United.

Fumaria vaillantii Kent records to 2024 mapped at tetrad level, from BSBI database.



Maidstone, an atypical habitat. Photo by Daphne Mills, 12 August 2012

Habitat, Eynsford. Photo by Rodney Burton, 16 August 2020

Our most persistent recent sightings have been alongside an arable field near Eynsford, where Rodney Burton has recorded it 2013-21. Here it has to survive crop herbicidal treatment, and this has been by growth in a gutter-like depression sheltered from spray between the crop and a grassy by-way which traverses the field. The commonest associated species in 2020 was *Euphorbia helioscopia* (Sun Spurge); others included *Aethusa cynapium* (Fool's Parsley); *Fumaria densiflora* (Dense-flowered Fumitory), *Matricaria chamomilla* (Scented Mayweed), *Papaver rhoeas* (Common Poppy), *Roemeria hybrida* (Prickly Poppy) and *Viola arvensis* (Field Pansy). Later that year, the depression was removed by extended ploughing so that in September 2020 the habitat no longer existed. However, the next year (2021) it was frequent in a nearby field border.

Fumaria vaillantii is distinguishable by its small (5-6mm) flowers and minute sepals (no more than 1mm long). Its usually pale pink flowers should separate it from the white (at first) flowers of *F. parviflora*. The latter also has channelled leaf-segments (flat in *F. vaillantii*) and bracts at least as long as fruiting pedicels (shorter in *F. vaillantii*). The colour of the flowers might lead it to be confused with Common Fumitory, *Fumaria officinalis* subsp. *wirtgenii* (which also has relatively few flowers per raceme, as with the Few-flowered Fumitory). However the sepals of Common Fumitory are twice as large as those of Few-flowered Fumitory.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Biggin Hill	TQ4057		21 June 2015	RMB	Edge of oat crop TQ 4072 5709, W and SW of Lusted Hall Farm.
Near Eynsford / Farningham	TQ5466, TQ5565, TQ5566		(1) 28 May 2021 (2) 16 August 2020 (3) 25 July 2013	(1), (2) (3) RMB	(1) TQ 546 559 to TQ 547 660, frequent at field border behind top few houses of Priory Fields. (2) chalky field border beyond end of Priory Lane, Eynsford TQ 5484 6677 to TQ 5505 6604, 20 plants of varying ages. (3) (a) East side of byway from Priory Lane, Eynsford to Beesfield Farm, Farningham, TQ 548 660 and TQ 549 660. (b) East side of same byway, TQ 550 660 and TQ 551 660. (b) Field border going uphill south west of Beesfield Farm, TQ 552 659.
Horton Kirby	TQ56T		28 June 2002	EGP & PHe (Philp, 2010)	Cornfield.
[North of Goudhurst]	[TQ73J]		[1988]	[EGP]	[A surprising record, if correct, off the chalk. But as it is in neither EGP's card index nor his WFS diary, it, this may not be his record at all.
Maidstone (vc15)	TQ7556		12 August 2012	DM (conf. EGP)	TQ 75536 56386, conf. EGP, an area roughly 2 x 5ft beside fairly newly installed fence at Maidstone United's football ground, straggly and mixed with *Lepidium didymum*.
Near Snodland	[TQ76A]		After 1990, before 2006	EGP (Philp, 2010)	Disturbed chalky soil. It is unclear, however, whether this record for tetrad TQ76A given in Philp (2010) is in addition to or in conflict with the following record.
Burham	TQ7162		7 June 1995	EGP & DC	TQ 715 624, seen as part of a meeting (per SP, who recollects it at a field margin, det. EGP). This map reference is on the vc15 side of the River Medway and may equate with a record given in EGP's database for tetrad TQ76B (called Holborough, but the naming probably does not distinguish between the different sides of the river and vice counties). It was omitted from Philp (2010), presumably as an oversight.
Sevington, Ashford	TR0441		23 August 2020	DS	Several plants at side of superstore in recently disturbed ground at TR 0409 4143.
West Langdon	TR3247		16 September 2023	SC	Two plants noted at TR 326 475.

Kent Rare Plant Register
Species accounts Part G

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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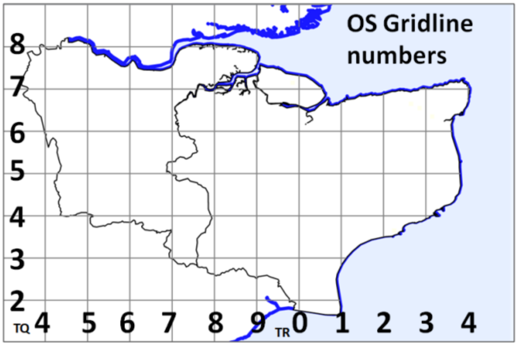
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at **tetrad** (2 x 2km squares) or **monad** (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

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AG Alfred Gay
AGa Andrew Gagg
AH Andrew Henderson
AHe Alan Heyes
AJ Clive Jermy
AK Alan Kenworthy
AL Alex Lockton
BBG Bradford Botany Group
BW Brian Woodhams
CD Chris Dyson
CEC Carter Ecological Consultants
CFB Chris Forster Brown
CO Colin Osborne
CR Chris Rose
CSu Caroline Sutton
DC David Carder
DCh Danny Chesterman
DCha David Chambers
DG Doug Grant
DGr Dave Green
DMC David McClintock
DM Daphne Mills
DP David Penney
DR David Roche
EGP Eric Philp
ERL Environmental Resources Ltd
FR Francis Rose
FJR Fred Rumsey
GH Geoffrey Hall
GHi Gareth Hirons
GK Geoffrey Kitchener
GP G. Pell
HH Helen Hudson
HP Horace Pratt
JA Jan Armishaw
JBe Jim Bevan
JC Juliet Cairns
JH Jan Hendey
JK J.D. Kesby
JL James Lindesay
JLa Jacky Langton
JLo Judith Lovelady
JM J. Moore
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JPu John Puckett
JRP J.R. Palmer
KBRG Kent Botanical Recording Group
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LNHS London Natural History Society
LR Lliam Rooney
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MG Mark Gurney
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NS Nick Stewart
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PS Pete Akers
PHe Peter Heathcote
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PW P.J. Wilson
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RB Richard Bateman
RC Ray Clarke
RD R. Dix
RF Lady Rosemary FitzGerald
RG Bob Gomes
RK R.J. Keymer
RM Richard Moyse
RMB Rodney Burton
RP Roxane Pirbonyeh
RS R.J. Stewart
RW R H. Woodall
SB Sue Buckingham
SC Steve Coates
Sp Sue Poyser
TI Tim Inskipp
TCGR Tim Rich
TR T.Ruck
WFS Wild Flower Society
WG W.J. Garforth

Other abbreviations and references:

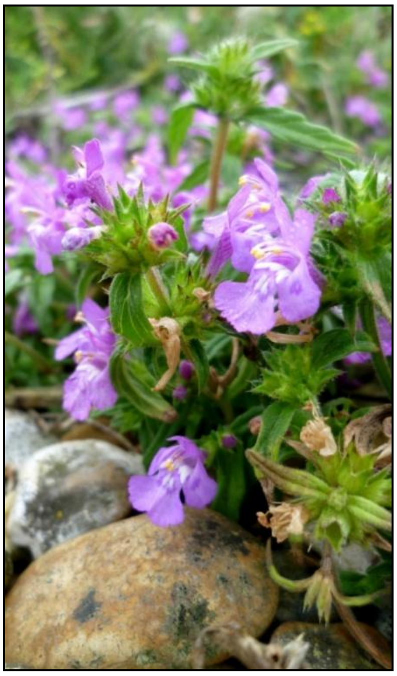
BM =Natural History Museum herbarium	Hanbury & Marshall (1899) refers to their *Flora of Kent*	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MNE = Maidstone Museum herbarium	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
CGE = Cambridge University herbarium	MoD Ministry of Defence	SLBI = South London Botanical Institute herbarium

Galeopsis angustifolia Erh. ex Hoffm. (Red Hemp-nettle)

vc 15; appears to have gone from vc 16

Rarity / scarcity status

Red Hemp-nettle was formerly widespread in the British Isles as an annual of cornfields, waste and open ground. It has contracted in range considerably with changing agricultural methods, including increased fertiliser and herbicide applications, earlier ploughing of stubble and an increase in winter sowing of crops, rather than spring. As a result, it is considered to be **nationally scarce** and **Critically Endangered** both in England and in Great Britain as a whole, at extremely high risk of immediate extinction in the wild, and it is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. In Kent, the species is **scarce.** It is a Kent axiophyte, indicative of good habitat, although it is now a shingle, rather than arable, plant.



Dungeness. Photo by Owen Leyshon, 2011

Account

The first published Kent record is by Thomas Johnson in his *Iter Plantarum* (1629), as found on 13 July that year in travelling between Gravesend and Rochester. In the archaeological record, however, its presence is evidenced by two seeds (det. J.R.B. Arthur) found in clay daub from the late 14th century building known as Wealden Hall, London Road, Larkfield[249]. Hanbury & Marshall (1899) regarded Red Hemp-nettle as frequent in Kent, giving stations for it in all ten botanical districts into which they divided the county. Most of their cited records are for cornfields, but there are references to its occurrence on downs and in a chalk pit. This diversity continued to be shown in records during the 1940s and 1950s with, for example, sightings in a cornfield margin at Downe (1943); in an arable field on chalk north west of Eynsford (1954); on open chalk on downland north of Kearsney, Temple Ewell (1949); in open chalk soil on cliffs at Kingsdown (1946); and on shingle at Dungeness (1946-56).

By the time of Philp (1982), however, *Galeopsis angustifolia* had become largely restricted to Dungeness, elsewhere being a scarce weed, very local in cornfields on the chalk. The last focus of cornfield records appears to have been in East Kent, in the Tilmanstone / Studdall / Ringwould area. During the 1991-2005 county survey (which saw a reduction to four tetrad records from 17[250] recorded during 1971-80) the species was no longer to be found as an arable weed. The seed-bank from arable occurrences is likely to be exhausted, even though the seeds have long viability, with the possibility of germination up to 20 years after a previous disturbance.[251] Recording in 2010-24, however, has restored the level to nine tetrads (15 monads), all as a shingle plant except for one site where Plantlife have attempted to reintroduce it as an arable species (September 2020, still present 2024, on an arable margin in East Kent, not included in the data table below), using Wiltshire seeds resulting in 660 plants recorded in 2021 and 367 in 2023, but carrying contamination with *Silene gallica* (Small-flowered Catchfly) seed, both in Kent and elsewhere.

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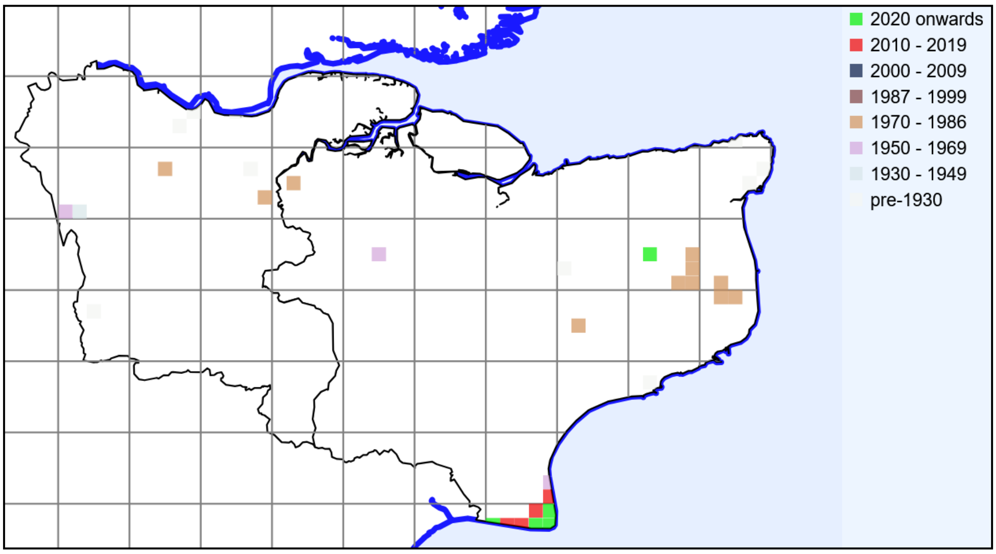
[249] Grove, L.R.A (1964). Archaeological notes from Maidstone Museum. *Archaeologia Cantiana* for 1963, **78**: 188-203.

[250] The non-Dungeness tetrad records were for TQ56M, TQ66W, TQ76H, TR14H, TR25Q, V, W, X, TR34J & P, TR35F.

[251] Back from the Brink Species information guide: Red Hemp-nettle *Galeopsis angustifolia*. Plantlife at https://naturebftb.co.uk/wp-content/uploads/2019/06/Galeopsis-angustifolia-Red-hemp-nettle.pdf (accessed 13 January 2020).

Red Hemp-nettle is an annual germinating fairly late in spring, requiring well-drained soil with limited competition. Fertilised crops may out-compete it, but the shingle of Dungeness can provide a sufficiently sparsely vegetated habitat that the species can thrive, particularly in disturbed terrain, where it acts as a pioneer species. Once succeeded by grasses or other shingle plants such as *Centranthus ruber* (Red Valerian), *Echium vulgare* (Viper's-bugloss) or *Jacobaea vulgaris* (Common Ragwort), it appears to be out-competed, so a level of repeated disturbance appears to be required in order that Red Hemp-nettle may thrive. Accordingly, the established vegetated shingle ridges do not normally support it.



***Galeopsis angustifolia* Kent records to 2024 mapped at tetrad level, from BSBI database.**

N.B. the recent inland site is a Plantlife introduction.

Galeopsis angustifolia has been known at Dungeness at least from the 1860s and has been recorded frequently from there since. There have been recent records from easternmost Dungeness (particularly the sides of the road south from the Pilot and the lifeboat station down to the old lighthouse car park, along which vehicles frequently get stuck, with shingle disturbance arising as they are dug or pulled out) and as far west as the Lydd Ranges. Between these, just inland of the southern coastline, it may be seen in the vicinity of the power station, reflecting the existence of good colonies within the secure areas which are not accessible by the public, particularly between the perimeter security fences of the operational compound for (the non-generating) Dungeness 'A' power station where it has been monitored at least between 2007 and 2010. The regular strimming applied to this zone to aid the security laser beams presumably maintains the disturbed conditions needed by the species, as also annual herbicide applications where undertaken. Other parts of the power station complex apparently carry a scattering of occurrences on disturbed shingle or in the cracks of car park hard-standing or road surfaces. There appears to have been a decline in numbers within the power station complex since the 1990s/early 2000s.

Dungeness. Photo by Owen Leyshon, 2012

The Red Hemp-nettle follows the Dungeness shingle up the Coast Drive to Lade, either on the seaward side of the road (in small numbers due to the thicker vegetation) or on the shingle patches in front of the houses, where occupiers prefer the appearance of bare shingle and keep turning it over to discourage vegetation establishment.

Whilst Dungeness has over the decades since the 1940s seen much shingle disturbance in terms of wartime defences construction, gravel extraction, railway works, building new power stations and new houses, the level has diminished with stricter conservation designations. However, the coastal strip from Greatstone to Dungeness has around 1,000 homes and accepts about 600,000 visitors per year to the Point, so that management of the National Nature Reserve entails a degree of restraint on shingle disturbance which might otherwise arise through motorbikes, quadbikes, fly-tipping, off-road 4x4 vehicles and other activities, although the fortunes of the Red Hemp-nettle follow the balance between restraint and disturbance. It is unsurprising to find that its current distribution correlates with the areas of highest inland shingle disturbance, from Lade down the housing development onto the Point and around the power station complex across onto Lydd Ranges.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Lydd Ranges (Midrips south)	TR0017		19 August 2024	AL & RD	TR00481783. On the Green Wall. Denge Beach. SD1 Glaucium flavum community.
Lydd Ranges (South Brooks)	TR0217	MoD land, SSSI	(1) 6 August 2012 (2) 30 May 1993	(1) OL, GK, TI & SB (2) EGP & JBe	(1) On disturbed shingle by military road (South Brooks Road) and railway at TR 02248 17747 from corner scattered over c.30m north eastwards. (2) Given as TQ01I.
Dungeness, Pen Bars	TR0516	SSSI	9 August 2012	TI	TR 05961 16844 to TR 06045 16871 (568 plants).
Dungeness, west of power station	TR0616	SSSI	(1) 20 August 2024 (2) 7 August 2017 (3) 9 August 2012	(1) AL & RD (2) BBe (3) TI	(1) (a) TR 0624 1688. Denge Beach. (b) TR 0624 1688. Stable shingle behind ridge. Denge Beach, SD1 *Glaucium flavum* community. (2) TR 063 169, in lichen heath/ shingle vegetation. (3) TR 06110 16874 to TR 06041 16839 (517 plants).
Dungeness, ARC site	TR0619	SSSI	8 August 2012	TI & SB	One plant by path at TR 06449 19886.
Dungeness, power station and vicinity	TR0716, TR0717, TR0816, TR0817		(1)20 August 2024 (2) 17 July 2021 (3) 22 June 2014 (4) 20 August 2011 (5) 2010 (6) 5 August 2010 (7) 20 July 2010 (8) 20 & 21 July 2010 (9) 26 July 2009 (10) After 1990, before 2006	(1) AL & RD (2) DS (3) KBRG meeting (4) SB (5) TI (6) DJ (7) Monitoring survey (8) ditto (9) CFB (10) EGP (Philp, 2010)	(1) TR 0769 1673. Denge Beach. (2) Large patch of flowering plants at TR 0843 1662 amongst lots of *Crithmum maritimum*. Easily over a hundred plants, but vulnerable for being so concentrated in such a small area. (3) TR0817. A few seedlings on shingle within boundary of power station, TR 0808 1710. TR0717. A single plant on bare shingle, recently disturbed TR 07976 17100. (4) 30 plants on 4 square metres of shingle and sand, TR 08429 16632. (5) TR0816. (6) TR0716. On shingle outside Power Station wall, approx. 150-200 plants, full flower, covering 2 square metres, given as TR0775 1657, probably TR0775 1662. (7) TR0817. Extensive populations in zone between northern perimeter security fences of 'A' power station (eastern end of power station site). (8) TR0716, TR0717, TR0816, TR0817. Within the 'B' power station complex, a generally very sparse and thinly distribution, usually as isolated or small groups

					of plants, always associated with patches of bare shingle or cracks in hard standing/road surfaces. Largest concentration of plants was c. TR 082 171 where deliberately disturbed in 2008 and subsequently kept open by trampling. (9) TR0816. Thousands of plants between security fences at Power Station, TR 08004 16684, seemingly favoured by annual spraying of this area. (10) Recorded as TR01Y.
Dungeness, Long Pits	TR0818	SSSI	(1) 23 August 2021 (2) 3 July 2011 (3) 27 July 1996	(1) AL (2) TI (3 EGP	(1) TR 087 184. Three or four clumps by the back wall of Westview Cottage. (2) TR0818. (2) May be TR0818, but given as TR01Z, Lydd-on-Sea.
Dungeness, Lydd-on-Sea	TR0819	SSSI	(1) 23 August 2013 (2) 10 August 2013 (3) 2012 (4) 21 July 2010 (5) 8 August 1986	(1) CO (2) TI (3) OL (4) MG (5) AGa	(1) Frequent by kerbs and on shingle. (2) One plant. (3) TR 08390 19743 {N.B. this grid reference appears inaccurate, TR 085 208 would be more likely], Coast Drive just north of Lade car park (the then most northern recent record). (4) c.20 plants at junction of Kerton Road and Pleasance Road. (5) TR 085 191 and TR 084 190 (both near Kerton Road).
Dungeness, east	TR0917	NNR, SSSI	(1) 4 August 2024 (2) 26 June 2022	(1) RP (2) KBRG/WFS meeting	(1) On the sea-side edge of the road between Prospect Cottage and Dungeness Snack Shack. (2) Patches of plants on shingle, just east of the road at TR 0931 1777.
Dungeness, lifeboat station	TR0918	SSSI	3 July 2011	TI	TR 092 185, 5 plants on a mound of recently disturbed shingle and soil.
Lade	TR0820		(1) 2010 (2) After 1990, before 2006	(1) OL (2) EPG (Philp, 2010)	(1) In the middle of an active shingle quarry (Kerton Road Quarry) at TR 08403 20957 (site may since be under water). (2) May be this monad, but recorded just as TR02V.

This account has benefited greatly from the assistance of Owen Leyshon.

Galium parisiense L. (Wall Bedstraw)

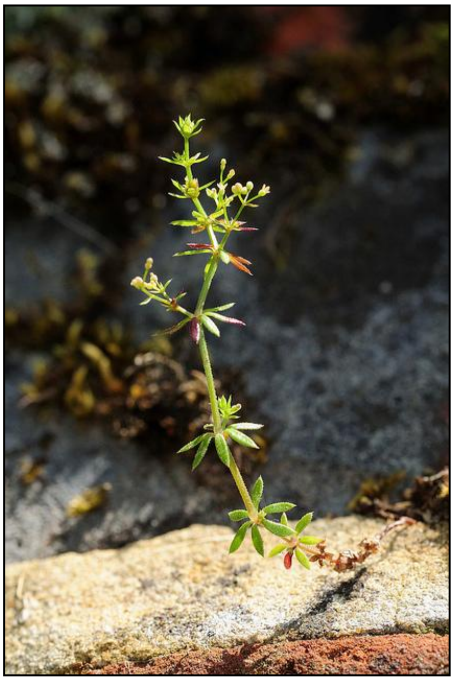
vc 15 and 16

Rarity / scarcity status

Galium parisiense is primarily a plant of East Anglia, with a scattering of records across south east England and outliers in Devon. Historic losses appear to derive from 'improvement' of the infertile soils which it favours and changes to walls on which it grew; and its conservation status in England and in Great Britain as a whole is **Vulnerable** to the risk of extinction. *Plant Atlas 2020,* however, notes an expansion over the preceding two decades in southern, eastern and south-western Britain and Kent has contributed to this. In Kent, it has been considered scarce, but it appears commoner than this.

Account

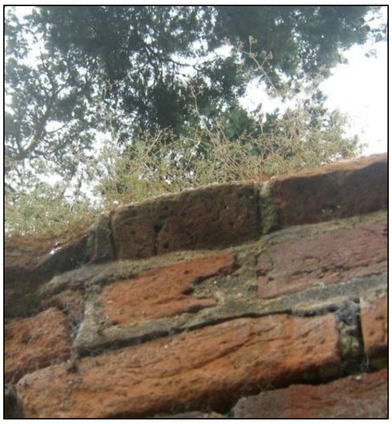
The first county record for Wall Bedstraw is in the third edition (1724) of John Ray's *Synopsis Methodica Stirpium Britannicarum*, where the least Goose-grass is said to have been 'At *Eltham* on a Wall going to the Court, and in many other Places; *Mr. J. Sherard'.* The Court was presumably the outer court of the decayed Eltham Palace, then occupied as a farm and with walling of mediaeval origins. According to Wolley Dod, the species was still there in 1894. It is, however, unlikely to have survived the restoration and new building works undertaken in the 1930s. Another early record with long continuity is that of William Hudson in the second edition of *Flora Anglica* (1778), where he refers to the small Ladies Bedstraw as present on top of a wall in Farningham Castle. This is at present a bumpy field north east of Farningham High Street, but in the mid-18th century it would have constituted the remains of a 1740 manor house which had burned down before completion of construction and which was on the castle site. On the opposite side of the High Street is now the current Manor House with a long brick wall, listed as 18th century, and *Galium parisiense* is still present here, despite some vigorous re-pointing of the wall in 2000, having crossed the road. Hudson also recorded it between Dartford and Northfleet, and Dartford is the location for perhaps the earliest known specimen, collected by Samuel Dale (1659-1739), **BM.**



Lullingstone. Photo by Lliam Rooney, 18 June 2011

Hanbury & Marshall (1899) cited few Kent records apart from these, regarding the species as very rare and local; neither had actually seen it in the county, except at Farningham. There are other mural records for north west Kent which can no longer be found: a wall in Bromley noted by Milne and Gorden in their *Indigenous Botany* (1793) and old walls near Orpington Church (1843, specimen in **CGE**). Further records on old walls have since been noted and may have been overlooked before. It has been present on an old wall at Chelsfield Church, the boundary with Court Lodge (an 18th century building, the wall appearing no older), at least since 1945 (Francis Rose). It was recorded on an old wall at Lesnes Abbey in 1954.

It is also present in various places on the walls of the gardens at Lullingstone Castle – these are listed buildings, described in the listing as structures dating from the 17th to the 19th century – but it may have been introduced here. W.H. Griffin referred to Wall Bedstraw in the Woolwich Surveys (1909) as on garden walls in Lullingstone Park since 1905, but a specimen in **SLBI** labelled by him as from Lullingstone Castle on 27 July 1904 is annotated 'seed planted 28.3.1904'. Whilst this could indicate that the specimen was cultivated from seed obtained at Lullingstone Castle in 1904, his record from 1905 might be interpreted as suggesting that there was seed sowing in 1904 which could only be fairly recorded once it had reproduced on its own account so as to re-appear next year.



Chelsfield Church. Photos by Geoffrey Kitchener, July 2011

Farningham. .Photos by Geoffrey Kitchener, 2011

Lullingstone Castle .Photo by Geoffrey Kitchener, 2011

Setting aside botanists' introductions, it is unclear how Wall Bedstraw got to old walls in the first place. Rodney Burton[252] suggests that, given the age of some old walls in Britain where it is present, it is tempting to speculate that a warmer climate between 1150 and 1300 may have enabled a rapid spread northwards in western and central Europe. The mechanism of spread is uncertain. It may have been an undetected quarry plant reaching walls via lime and sand mortar; or it may have arrived with birds although the fruits themselves (except for a mainland European variant of Wall Bedstraw with fruits having hooked bristles) do not have a means of anchoring themselves to birds, unless a fragment of the stem, which is rough and bristly, bearing fruits becomes hooked up in plumage. It is, however, apparent that old wall tops provide a very suitable habitat – well-drained and with minimal competition for this small annual. In particular, the sloping batter at or towards the top of walls shown in the illustrations for Chelsfield, Farningham and Lullingstone is well favoured by this species.

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[252] Galium parisiense L. in (ed.) Stewart, A., Pearman, D.A. & Preston, C.D. (1994) *Scarce Plants in Britain*, JNCC, Peterborough.

Wall Bedstraw, however, is also found as a plant growing on bare, well-drained ground, and not just where it may have seeded into gravel or the like below walls. William Hudson's 1778 records include mention of the plant between Dartford and Northfleet, without reference to any wall, and although this may not necessarily be an example of continuity, the species has been known at least since 2003 at Northfleet Green, on the semi-bare ground of a disturbed roadside, the soil being somewhat flinty, with sandy tertiary drift and some calcareous influence. Other relatively recent ground-growing sightings include a former ragstone quarry at Ditton (somewhat equivocal in view of a number of introduced species at that locality) and extensive populations on compacted sand over shingle on MoD land at Lydd Ranges. A habitat which does not seem to have been replicated since is at Lydden Spout, published by G.E. Smith in 1829 (*A Catalogue of Rare or Remarkable Phaenogamous Plants collected in South Kent*), although it is unclear whether Smith was referring to the foot, sides or top of the chalk cliffs. He remarked on this find being of the 'hairy variety' (presumably with bristly fruits)[253]. Bristly fruited *G. parisiense* is very rare in Britain, although it is the norm in, e.g. Spain, and forms part of Linnaeus' description of the species.[254]

Northfleet Green, habitat. Photo by Geoffrey Kitchener, 13 July 2011

There are also occurrences in more artificial habitats, which admit of no easy explanation. It has been known as a railway ballast plant in Kent, being at Sandwich railway station (at least 1946-56) and by the railway at Snodland in the 1930s and Chilham station platform in the 1940s, leaving an open question as regards whether it came with railway materials or with transported goods. Its presence on the margin of a tarmac footpath at a Tonbridge roundabout (2011) is mysterious, but could be an introduction from mainland Europe on vehicle tyres; there is also a road association with the A249 at Sheppey crossing (2024). Where found at Hurst Wood alongside the high speed 1 rail link on sand (and the further drainage afforded by anthills), it may be associated with the rail construction.

The *Galium parisiense* discovered in Betteshanger (formerly Fowlmead) County Park (2012) has no obvious origins, but the sharply draining colliery spoil, whose lack of nutrients keeps ground free from competitive plant growth, indicates a very suitable habitat. It has been discovered in 2020 as extraordinarily extensive in a neighbouring Betteshanger site, on the same substrate, since being developed. This suitability is echoed by its discovery on colliery waste in West Lothian in 2013. An analogous discovery, although on a semi-bare chalk substrate, is (2023) at Peter's Pit near Wouldham, where there were tens, if not hundreds, of thousands of plants on the floor of a chalk pit worked intensively in the second half of the nineteenth century, but closed to chalk quarrying in 1925-26, albeit with bare chalk and some vegetative colonisation visible in aerial photos from 1940 and 1960. Plants were widespread where the ground was still semi-open or partly moss-covered, with associates including *Catapodium rigidum* (Fern-grass), *Vulpia bromoides* (Squirreltail Fescue) and the rarity *Vulpia unilateralis* (Mat-grass Fescue). Most plants at Peter's Pit were small, slender and stress-reddened with their flowers minute and not easily observed, although fruits were forming. However, in a couple of places the presence of damp and/or shade had resulted in more substantial growth, green stems and conspicuous relatively large white flowers, the impression given being similar to that of *Galium pumilum* (Slender Bedstraw), but with rough stems and leaves with forwardly-directed prickles.

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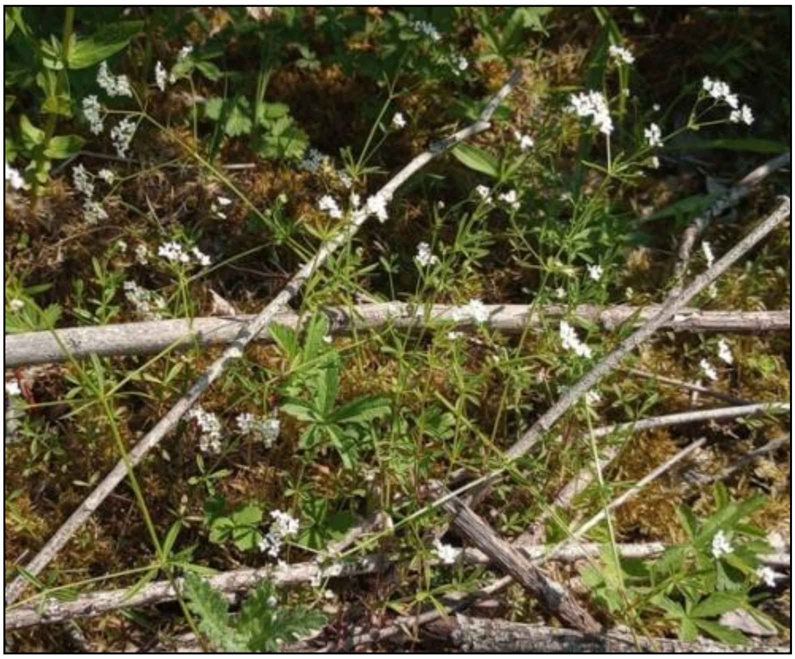
[253] Authorities have assumed the accuracy of the identification by Smith, who was a very reliable botanist. Smith in his annotated copy of the *Catalogue* referenced this plant to the relevant plate and short description in Sowerby's *English Botany* (given there as *G. anglicum*) and may not have known the plant otherwise. *English Botany* also has a short description and somewhat scrappy plate of *G. pumilum* (given there as *G. pusillum*) and this species is a much more likely one to have been found – being a location west of Dover analogous to the *Galium pumilum* site at Langdon cliffs to the east. If there was a misidentification, then this would have arisen from inadequacies of the *English Botany* descriptions; the plants would have to have been in fruit rather than flower (*English Botany* is clear about the small greenish-white flowers of *G. parisiense* and the conspicuous milk-white flowers of *G. pumilum*) and Smith would have had to have taken the fruits of *G. pumilum* (which are covered in fine papillae) as the hairy-fruited form of *G. parisiense*. However, the discovery in 2014 of *G. parisiense* on concrete and gravel at Samphire Hoe shows that it is capable of turning up on this general section of coast, and so the likelihood of misidentification is not high.

[254] Edgington, J. (2016). *Galium parisiense* (Wall Bedstraw) – a fruity story. *BSBI News* **134**: 12-14.

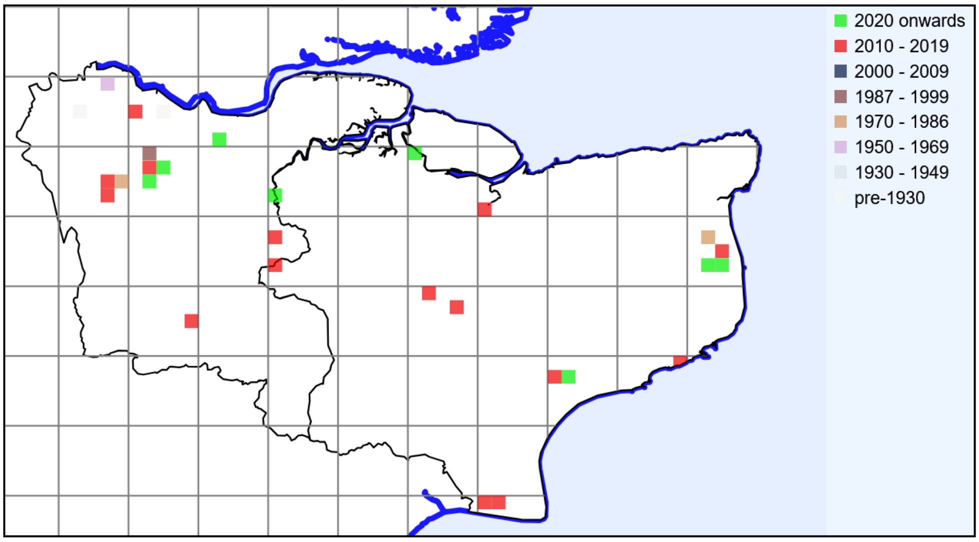
Peter's Pit, with *Catapodium rigidum* and *Vulpia unilateralis*. Photo by Geoffrey Kitchener, 16 June 2023.

As Philp (1982) and Philp (2010) give only three tetrad records for this species (albeit only two of these are the same), this would have led to an assessment of the species' status as rare, but for its presence in metropolitan vc16, not covered by those publications.



Peter's Pit, damp ground inducing anomalously vigorous growth. Photo by Geoffrey Kitchener, 16 June 2023.

For initial purposes of this register, the species was assessed as scarce. However, the extent of new Kent finds during the period 2010-24 has transformed this picture. Rodney Burton (as former national referee) pointed to some new finds nationally since 2004 by experienced botanists and to the potential for this rather insignificant plant to be overlooked. The national risk categorisation was formulated by reference to data before any emerging trend for new finds. A comparison of Wall Bedstraw's area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 45% in the likelihood of recording the species, and this is what gave rise to its assessment as Vulnerable. In Kent, the species has been recorded in 23 tetrads (30 monads) during the period 2010-24, a sharp contrast to the three tetrads in Philp (2010).



***Galium parisiense* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The expansion seems largely to be related to its discovery as a ruderal, appearing on artificial surfaces or sharply draining substrates where disturbed by human activity. It appears currently more common in the county than at any other time from which adequate records are available. It may be that the increase represents increased survival of casual introductions with climate change (noted in Belgium from c. 2010, where the species is an alien).[255]

Site	Grid reference	Site status	Last record date	Recorder	Comments
Chelsfield Church (metropolitan vc16)	TQ4763, TQ4764		(1) 8 August 2018 (2) 16 June 2014 (3) July 2011 (4) 22 March 2009	(1) DGr (2) JP (3) GK (4) JP	(1) (a) TQ 47939 64005, large population growing along the length of the church boundary wall, possibly as many as 50 plants. (b) TQ 47940 63991, extension of TQ4764 population, but far fewer plants. Also TQ 47975 63982, only 2 plants. (2)TQ 479 639, over 1000 plants on the rear churchyard wall at St Martins. Recent clearance of shrubs and ivy has exposed the wall top to light and recorder supposes that seeds were dormant below the ivy covering (perhaps in the mortar?) Also, the ivy has recently been cleared from the brick wall opposite the porch and at least 100 plants were present here on ledges and wall top, not seen here by recorder before. (2) TQ 4793 6402, growing on sloping brick cap to churchyard western wall. (3) Noted as on top of wall which was more open following ivy removal. Present at least since 1945 (FR) with several records in the 1980s. Re-pointing and subsequent ivy growth appeared to have

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[255] Verloove, F. (2014). *Galium parisiense*, in Manual of the Alien Plants of Belgium. http://alienplantsbelgium.be/content/galium-parisiense (accessed 3 February 2017). See also Edgington, J. (2017), *supra*.

					diminished its extent until 2014, as RMB found it along 30 yards of wall-top in 1987.
Lullingstone Castle	TQ5264 & TQ5364	Walls are listed buildings.	(1) 11 June 2024 (2) 11 May 2024 (3) 16 June 2023 (4) 1 July 2022 (5) 7 March 2022 (6) 9 July 2021 (7) 9 May 2021 (8) 4 July 2013 (9) 18 September 2011 (10) 19 August 2011 (11) 15 June 2011 (12) 26 September 2010 (13) 1986	(1) AK (2) GK (3) GK (4) JP (5) GK (6) GK (7) RMB (8) & (9) RMB (10) & (11) GK (12) RMB (13) RMB	(1) TQ 5293 6441, Lullingstone Castle, photographed against brickwork, det. Tom Hart-Dyke. (2) TQ 5305 6450, outer face of Walled Garden brick wall in north east corner facing towards river. (3) (a) High up on western brick wall of Lullingstone world garden, TQ5364. (b) At low level on gatehouse and gravel beneath, TQ 5293 6441, query if introduced here, and also present on north wall brickwork of churchyard, TQ 5299 6445. (4) TQ5364, walls, Lullingstone Castle, and TQ5264, very abundant on gatehouse. (5) TQ 52948 64560, two plants having apparently overwintered on old north-facing brick wall. (6) TQ 53000 64524, high brick wall, near top, Lullingstone Castle world garden. (7) Doing well on outer side of Lullingstone Castle wall at the corner of the way down to The Bothy. (8) Walls outside corner of walled garden, only 6 by access to 'The Bothy' and 2 on W-facing wall. (9) c.20 plants on ground by gatehouse on the left as you go in, 6 on top of high wall facing the golf course near N corner of walled garden and up to 200 on wall by access road to The Bothy. (10) On internal walls of Lullingstone world garden, a small patch at TQ 5294 6449 and another at TQ 52995 64524. (11) TQ 52943 64558, 46 young plants on sloping ledge of old west-facing wall for c. 10m. TQ 52948 64561, large number of plants, continuous along ledge of old north-facing wall, for c.15m. (12) 300 plants on sloping ledge 150cm above ground on N-facing outside wall of castle walled garden, extending about 18m from NW corner (TQ 5294 6456) , and 5 plants on ledge 110cm above ground on N tower of castle gatehouse, on side facing castle (TQ 5293 6441). (13) TQ 5293 6445, good quantity on N-facing wall. Present at Lullingstone since 1904/5, with frequent records since, extending also to monad TQ5364 (RF, 1986), into which the garden walls run.
Farningham	TQ5466, TQ5467	Wall is listed building	(1) May 2023 (2) 2020 (3) 13 May 2017 (4) 19 August 2015 (5) 18 July 2014 (6) 2 August 2013	(1), (2), (3), (4) (5) (6) & (7) RMB (8) GK (9)-(13) RMB	(1) TQ5466, not seen on Manor House wall, but plentiful at foot level at stone bench at TQ 5470 6695. (2) TQ5466, on wall of Manor House, starting about 10 metres

			(7) 1 July 2013 (8) 5 April 2013 (9) 16 August 2012 (10) 18 April 2012 (11) 19 June 2011 (12) 5 May 2011 (13) 3 July 2000		from end nearest church, and abundantly on top of wall across the road, a new site. (3) None on wall-top now, but plenty of young plants at base of wall. (4) Under threat on wall at TQ 5465 6698 because of spread of *Solanum jasminoides*, still flourishing in front of stone bench at TQ 5470 6695. (5) TQ5466. At least 22 plants in front of stone seat, 42 on wall in front of village hall and 44 on Manor House Wall. (6) TQ5466. Several plants on wall of Manor House at south east corner, one on churchyard wall next to west gate. (7) TQ5466. NE side of High Street opposite bank in front of stone seat in wall. (8) TQ5467. Last year's dead growth on top of brick/flint wall, TQ 546 670, in High Street opposite Manor House wall. (9) TQ5466. 36 plants: 22 on slope of wall in front of Parish Council notice board, 14 on wall of Manor House, some of them large, 0 in front of stone bench. (10) TQ5467. Manor House wall (the north western end falls within this monad). (11) TQ5466. 12 plants on NE side of High Street opposite bank in front of stone seat in wall - area cleared of weeds by parish council volunteers on 15/8/2011. Seed scattered here and on Manor House wall by RMB on 3/10/2011. (12) TQ5466. One plant on Manor House wall, and two on outside wall of churchyard 3m up side road from gate. (13) The population was recorded as in two parts: the larger part is on the sloping top of the wall in front of the manor house (TQ 546 669), and until 3 July 2000 numbered many hundreds of plants growing almost continuously for about 40m x 20cm. On that day, as the recorder arrived to estimate the numbers, the last of the plants was being stripped off ready for the wall to be re-pointed. However, plants remained on the narrow wall-top and the population could be expected to recover, as it has done before. [In fact, the recovery has not been good.] There was a secondary population further east on the other side of the road at TQ547669, opposite gate of glebe house, numbering about 10 plants. There are many earlier records for this site, which has historic origins – see text of account.
Tonbridge	TQ5944	Highway	24 August 2011	SB	14 plants on ground at margin of tarmac footpath, Vauxhall Lane 'roundabout', TQ 59468 44689.

Northfleet Green	TQ6271	Highway	(1) 28 August 2023 (2) 13 July 2011 (3) 3 October 2003	(1) GK (2) GK (3) EGP & PHe	(1) On Hog Lane road bridge over high speed rail link. On east side at TQ 6299 7149 for 1 metre, and on west side for 30m centred on TQ 6299 7154. (2) TQ 62791 71537, spread along c.15m of roadside bank thrown up from adjacent ditch. Flinty soil, somewhat sandy (from tertiary drift) and some calcicole flora (e.g. *Blackstonia*) in vicinity. *Galium* plentiful and (low) bushy in places. (3) Recorded as TQ67F.
Bayham Abbey	TQ63N		After 1970, before 1981	RC in Philp, (1982)	An old wall in Bayham Abbey grounds (although the old abbey ruins are outside both vc16 and the administrative county of Kent).
Teston	TQ7053		10 June 2014	DM	A few plants at TR 7073 5312 in a grassy area near Country Park car park and Teston Lock. This area had apparently been the parking area for heavy machinery used in recent reconstruction of the lock.
Ditton Quarry	TQ7157	Ditton Parish Council nature reserve	(1) 17 June 2014 (2) 15 June 2004	(1) DM (2) SB, PJ, JLo, KK	(1) TQ 71512 57409, an area c. 11.5 x 1.5metres, in upper part of quarry next to a path. Also in upper part of quarry: TQ 71678 57271, in flat short grassland area 20 x 30 metres and TQ 71557 57397, area approximately 7 x 9 metres. (2) Growing on ground in open, well-drained plateau area of former ragstone quarry.
Burham		Part SSSI, KWT reserve	14 June 2023	GK	(a) TQ 71342 62524, a small amount on land near river bank between Village Road and R. Medway where there has been movement of chalk in course of Peters Village development, which may have brought in seed from the development of chalk workings in neighbourhood. (b) TQ 718 626 and TQ 717 626, arable reversion south of Peter's Pit, extensive on semi-bare chalky surface vegetating over. (c) Abundant in tens, perhaps hundreds, of thousands on floor of Peter's Pit, west, southwest and south of western lake, on semi-bare chalk with partial moss cover and slowly colonising vascular plants. Sample gridrefs TQ 71714 62992, TQ 71711 62988, TQ 71705 62941, TQ 71664 62889, TQ 71659 62875, TQ71601 62807, TQ 71728 62804, TQ 71724 62779, TQ 71781 62782, TQ 71825 62698. Associated spp: *Catapodium rigidum, Conyza sanguinea, Crataegus monogyna, Erigeron acris, Lotus corniculatus, Medicago lupulina, Potentilla reptans, Poterium sanguisorba, Prunella vulgaris, Rubus cf. caesius, Viola hirta, Vulpia bromoides, Vulpia unilateralis*. Almost always small, reddish and droughted, but at 2 locations it was seen growing large and freely with green stems and leaves and prominent white

					flowers: one of these, at TQ 71715 6293, was a rut which had held water, the other, at TQ 7171 6294, was a shaded grassy slope down, 9 x 3m, towards wet ground. (d) TQ 71811 62991, on small chalk ridge se of western lake on floor of Peter's Pit, with *Vulpia unilateralis*.
Wouldham	TQ7163	Part SSSI, KWT reserve	14 June 2023	GK	(a) TQ 71717 63026, floor of Peter's Pit, semi-bare or mossy chalk surface with slowly colonising vascular plants, edge of extensive colony most of which is in TQ7162. (b) TQ 71971 63092, semi-bare or mossy chalk surface of access ramp rising from Peter's Pit to land being developed to the north east, southern aspect, with *Vulpia unilateralis.*
Tutt Hill	TQ7946		(1) 16 July 2017 (2) 10 June 2017	(1) KBRG meeting (2)> SL	(1) Plants spread over a couple of metres of the sloping bank south of the High Speed Railway at TQ 9777 4640. (2) Tutt Hill, HS1 railway bank along edge of public footpath in large arable field, near Ripple Wood, TQ 9776 4641. Plants spread over a few metres on hardcore/sand next to fence line. Presumably introduced here recently when HS1 embankment constructed on arable field.
Kingsferry, Sheppey	TQ9169		May 2024	BBe	Sheppey. TQ 9179 6989, dry grassland between the two bridges on the eastern side of the crossing from the mainland, along a c.30m strip on both sides of access track, plants typically c.10cm tall.
South of Charing Heath	TQ9348		(1) 24 June 2018 (2) 7 June 2015 (2) 29 August 2014	(1) SL (2) KFC meeting (2) AG, JP & MPh	(1) Proposed extension to Hurst Wood, Charing Heath (AS68), KWT survey, unmanaged grassland on north bank of HS1, approximately TQ 9303 4840. Abundant on anthills and other bare ground. Not found in grassland immediately to west in adjacent monad. (2) comm. JP, found on anthills and bare rabbit-disturbed ground. Several colonies, one at TQ 93020 48415, others nearby. (2) High Speed 1 railway verge near Hurst Wood, TQ 9304 4840; several plants noted on ant hills and grassy bank.
East of Lydd Ranges	TR0119		11 May 2014	TI	About 5 small plants at TR 01917 19544 between cycle track and road.
Lydd Ranges	TR0219	Dungeness, Romney Marsh & Rye Bay SSSI (MoD firing range)	6 August 2012	OL, GK, TI, SB	On compacted sand on shingle by military road, e,g. at TR 02984 19844 and TR 02987 19850. Also on compacted sand over shingle at TR 02789 19654 and nearby around TR 02819 19686 in light (but closed) sward on banks near lake.
Lydd Ranges	TR0319	Dungeness, Romney Marsh & Rye Bay SSSI (MoD firing range)	6 August 2012	OL, GK, TI, SB	Frequent around TR 03154 19685 in area of compacted sand on shingle, used for movement of sand in relation to adjoining sand heap. Also present on top of this, centred on TR 03132 19693.

South of Sellindge	TR1037		(1) 8 July 2017 (2) 10 June 2016	(1) BW (2) SB	(1) On compacted tracks, very scattered, not common. (2) Dense spread of plants for 40 yards on sandy banks of the M20 alongside a footpath at TR 1079 3772.
South of Sellindge	TR1137		8 July 2017	BW	On compacted tracks, very scattered, not common.
Westenhanger	TR1337		5 July 2021	SC	Extensive spread of plants along sandy bank by railway line.
Samphire Hoe	TR2939	SSSI	10 July 2014	SB & class	Many plants spread over several square yards of concrete and gravel at TR 2953 3927, just west of the tunnel entrance.
Betteshanger Sustainable Parks	TR3353, TR3352		(1) 29 May 2024 (2) 1 June 2020 (3) 26 May 2020	(1) DS (2) & (3) SB	(1) (a) TR3352 (b) TR 339530. (2) TR3353, Betteshanger Sustainable Parks, the spread of this plant is almost unbroken on barish areas of colliery shale throughout the entire area. (3) (a) a massive spread of plants on colliery shale in Betteshanger Sustainable Parks from near the old colliery building at TR 3386 5315 westwards and into TR3352. (b) massive spread of plants all over the colliery shale in Betteshanger Sustainable Parks to boundary at TR 3354 5268 and northwards into TR3353. (c) massive spread of plants all over the colliery shale in Betteshanger Sustainability Parks to the boundary at TR 3354 5268 and northwards into TR3353.
Betteshanger	TR3353		29 May 2024	DS	TR 341 533 Pavement plant in cracks and kerbs along Betteshanger Road.
Betteshanger (formerly Fowlmead) Country Park	TR3553, TQ3554	Formerly owned by Hadlow Group and managed as a country park, since acquired by developer Quinn Estates	(1) 1 July 2023 (2) 27 May 2014 (3) 12 June 2012	(1), (2) & (3) SB	(1) Abundant in area of dry substrate near the roundabout, Betteshanger CP at TR 3518 5398. (2) Abundant at the margins of the car park and alongside the cycle track nearby. (3) More than 100 plants in c. 1 x 0.5 metres of bare slag at TR 35794 53773.

Galium pumilum Murray (Slender Bedstraw)

vc 15 and 16

Rarity / scarcity status

Galium pumilum is a plant of chalk and limestone grassland in southern England, apparently in decline through loss of habitat and so regarded as **Endangered** in England and in Great Britain as a whole. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. Philp (2010) feared that this species was lost to Kent, searches having been made at previously recorded locations without success ('a tale of being ploughed up, scrubbed up, or grazed off'), but subsequently it has been found or re-found in five sites, and is treated as very **scarce** in the county. It is a Kent axiophyte, indicative of good habitat.

Account

Early Kent records are confused with *Galium saxatile* (Heath Bedstraw)[256], from which Slender Bedstraw was not always distinguished, although it is possible to surmise that a record from the chalk is likely to be the latter. This may be the case with several *Galium saxatile* records cited by Hanbury & Marshall (1899), such as a find on the Downs west of Folkestone by G.C. Walton. A discovery by Marshall of *G. saxatile* was cited from 'Between Lyminge and Paddlesworth, and in Paddlesworth Wood', which probably corresponds to a specimen in **SLBI** collected by him in 1893 which he annotated 'Abundant for a few yards in an apparently unbroken pasture; just outside & east of Paddlesworth Wood, E. Kent, on chalk. Looking quite indigenous.' He also indicated that he had not obtained a name for it, but it seemed to be a form not previously found in this county: 'Is a difficult plant!' This specimen is *Galium pumilum*.

Since then, there has been a thin scattering of occurrences on the chalk across the county, from Dover and Folkestone in the east, through to Parkgate Down (1986, Rosemary FitzGerald); the east side of Elhampark Wood (1950-57, Francis Rose); Juliberry Downs, Chilham (1945, Francis Rose); and west as far as Francis Rose's records at Romney Street (north of that hamlet, in scrub on non-calcareous loam, 1952); and on downs grassland north of Pilgrim House, Westerham (1955). Except for Dover, these sites are now lost, but indicate a degree of continuity of earlier distribution along the North Downs, picked up later at Colley Hill, Reigate in Surrey.

Temple Ewell/Lydden. Photo by Lliam Rooney, 22 June, 2011

The most consistent sightings, however, have been in three locations. At Langdon cliffs it has been seen sporadically from 1950 to 2023, despite competition *from Brachypodium rupestre* (Tor-grass) which seems to have increased 2011-23. On the downs at Temple Ewell there are records from 1945 (by Francis Rose) to 2013. At Purple Hill near Kemsley Street it has been known at least from 1960 to 2011. All these sites have in common an open aspect on sloping, well-drained chalk terrain, generally bearing short turf. They are fairly species-rich sites. At Purple Hill, some 20 species were recorded in 2011 within one metre of a sample plant, generally of usual chalk grassland plants such as *Briza media* (Quaking-grass), *Origanum vulgare* (Wild Marjoram) and *Thymus polytrichus* (Wild Thyme). The rare species *Polygala amarella* (Dwarf Milkwort) is also present on the same hill, but not in the immediate vicinity. The turf there (in 2011 and 2020) was maintained open by rabbit-grazing and occasional horse-grazing and there was a degree of light erosion, which may explain the number of seedlings found at that site (seedling establishment being apparently fairly rare in Britain). At Temple Ewell, in the 2011 the grazing regime appeared to restrain the influence of *Brachypodium rupestre* (Tor-grass) and there were good chalk grassland species such as *Genista tinctoria* (Dyer's Greenweed) and *Polygala calcarea* (Chalk Milkwort) in the immediate vicinity of the Slender Bedstraw. At Langdon cliffs, the species grew (2011) on a south-facing chalk grassland slope, with calcicoles such as *Hippocrepis comosa* (Horseshoe Vetch), *Origanum vulgare* (Wild Marjoram) and *Poterium sanguisorba* (Salad Burnet). However, *Brachypodium rupestre* (Tor-grass) was abundant, sometimes dominant, and Slender Bedstraw appeared to fare much better where there was less Tor-grass and more grazing and disturbance by rabbits.

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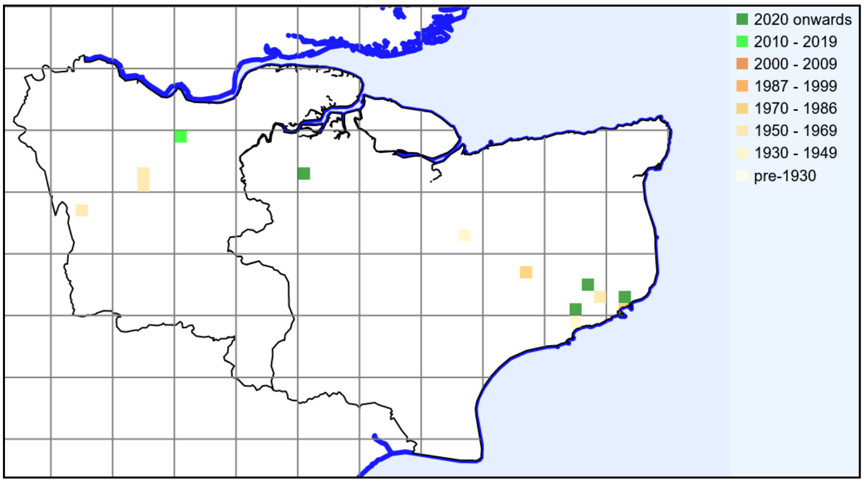
[256] See also the account of *Galium parisiense* for the possibility of early confusion with that species.

Purple Hill.
Photo by Geoffrey Kitchener, 23 June, 2011

An unexpected new site was found by David Steere in 2015, at Rectory Meadow, Longfield. This is a remnant of chalk grassland with a good flora, including *Orchis anthropophora* (Man Orchid) and much *Genista tinctoria* (Dyer's Greenweed), currently maintained as a local nature reserve, with coarse grass and scrub, which had developed from about 1990, kept at bay. Given the degree of public access, it might be considered surprising that the species has been so long overlooked, but it is very inconspicuous, even when in flower. Following another new discovery, by Alfred Gay in 2023 on a chalk grassland bank between South Alkham and Capel-le-Ferne, the total of sites noted in 2010-24 amounts to five tetrads (five monads).



***Galium pumilum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

An interesting connection between *Galium pumilum* and *Euphorbia cyparissias* (Cypress Spurge) was noted by Francis Rose and Jean-Marie Géhu[257] in the context of plants known in Kent but lacking in Pas-de-Calais -that there were formerly five East Kent localities in which both species were found growing together. This observation would not appear to detract from the native status of *Galium pumilum*, but may support the case for that status also applying to East Kent *Euphorbia cyparissias.*

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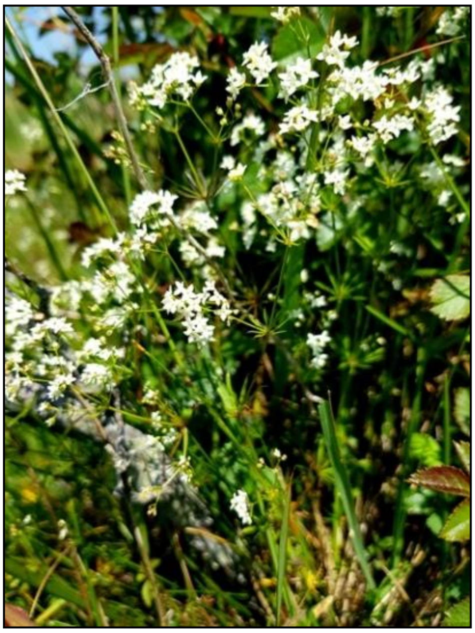
[257] F. Rose & J.M. Géhu (1960). Comparaison floristique entre les comtés anglais du Kent et du Sussex et le department francais du Pas-de-Calais, *Bulletin de la Société de Botanique du Nord de la France*, 13: 125-139. This association is also remarked upon by Rosemary FitzGerald (1994). *Galium pumilum* Murray Slender Bedstraw, in ed. Steward, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC.

Slender Bedstraw is distinguishable from other white-flowered Kent bedstraws by a combination of smooth-angled stems and mucronate-tipped leaves with at least some backwardly-directed prickles on the margins. It is not easy to pick out from the vegetation of chalk turf, especially when grazed down, and is most easily seen when coming into flower and before *Galium album* (Hedge Bedstraw) has provided too many distracting patches of white flower. Different populations appear to come into flower at different times.



Temple Ewell/Lydden, growing in the shelter of a rose bush.
Photo by Sue Buckingham, 10 June, 2023

Site	Grid reference	Site status	Last record date	Recorder	Comments
Rectory Meadow, Longfield	TQ6068	Local nature reserve	(1) 4 June 2015 (2) 28 May 2015	(1) DS & GK (2) DS	(1) At least four diffuse patches of plants, at TQ 60350 68576, TQ 60334 68561, and TQ 60350 68563 in Lower Meadow, and TQ 60327 68508 in Upper Meadow, in total amounting to a fairly wide spread through the more open areas of this two hectare local nature reserve. Accompanied by good chalk grassland flora, including much *Genista tinctoria*. (2) Discovered at TQ 60336 68496 etc., over 20 small plants scattered in grass meadow, flowering.
Purple Hill	TQ8162	SSSI	(1) 8 June 2020 (2) 23 June 2011 (3 16 June 2010 (4) 29 May 1986	(1) & (2) GK (3) FJR (4) FR & RF	(1) Location and habitat as 2011. (2) Abundant on upper slopes of chalky hill, in short turf becoming scrubbed with hawthorn, *Cotoneaster horizontalis* and *Rosa micrantha,* over about 25m x 15m between co-ordinates TQ 81294 62132, TQ 81303 62134, TQ 81299 62155, TQ 81291 62160, TQ 81286 62150 and TQ 81289 62136. Many patches, at times continuous in short sward. Just coming into flower. Many seedlings. Over 1000 plants. Also at TQ 81304 62162, an outlier from main colony, a patch in horse-grazed field to east, c.30cm x 50cm. (2) TQ 812 621, a very healthy population on upper parts of chalk slope, with the odd plant in the adjacent field to the west. (3) TQ 813 621 (or 2), in less grazed patch of down in north west corner of chalk pit.
Temple Ewell /	TR2745	NNR, SSSI	(1) 10 June 2023	(1) SB	(1) 2 patches of plants at location

Lydden			(2) 11 June 2013 (3) 26 May 2012 (4) 22 June 2011 (5) September 1996 (6) 5 June 1995 (7) 25 May 1986	(2) JA (at KBRG meeting) (3) BBG meeting (4) KBRG meeting (5) NF (6) FR (7) RF	previously unknown to recorder at TR 27972 45161. Continued presence at original (2011) location at TR 27728 45241, although less plants. A very large spread of plants from TR 27677 45275 to TR 27691 45297, a distance of c.26 metres with plants scattered throughout. (2) Well established at TR 27727 45255. (3) c. TR 2762 4526. Quite a lot just coming into flower, seemingly not uncommon (perhaps the wet weather earlier in May and throughout April had helped). From the wooden gate separating compartments 1 and 2 there is a small copse of mixed bushes c. 50m to the right (looking uphill). To the right of this, another 30m or so there were many scattered plants, also further down the slope and towards the old burnt spot. (4) TR 27721 45252, spread over about 2 x 2m of west-facing grazed downland slope, in area dominated by tor-grass, with associates as per BSBI TPP survey, about 10m north east of path, in fruit only. Shown by SB, by whom it was found a few days before. (5) TQ 276 453. (6) Locally abundant, TQ2745. (7) TR 277 452, lower part of lands east of entrance.
Park Gate Down	TR1645, TR1646	KWT managed reserve, SSSI	(1) 1999 (2) 11 June 1998 (3) 2 June 1986	(1) HH (2) FR & PG (3) RF	(1) Three clumps. [The location since became completely scrubbed over with *Prunus spinosa* (SB, 2011); scrub clearance was since undertaken by KWT, but the ground is not suitable (SB, June 2023).]. (2) TR1645. (3) TR 168 461 (or 2), north compartment.
South Alkham	TR2440		June 2023	AG	Waterworks Bank at TR 24397 40671, plants scattered over 3 x 6 metres of chalk grassland slope (west facing), just below a thicket of gorse and hawthorn. A visit was made by SB on 14/07/23 in order to examine fruits which under microscope were seen to have the low-domed tubercles that are required for this species.. Associates: *Thymus pulegioides* and *T. polytrichus, Festuca ovina, Primula veris* and *Poterium sanguisorba.*
Langdon cliffs, Dover	TR3342	SSSI	(1) 10 June 2023 (2) 9 June 2011 (3) 9June 2001 (4) 30 May 1986	(1) & (2) SB (3) RW (4) FR & RF	(1) Continued presence of plants at TR 3348 4221, still a healthy population but less plants than recorded in 2011. This probably due to competition from *Brachpodium pinnatum* agg. (2) At TR 3347 4221, estimated 60 plants on rabbit-grazed chalk grassland slope. Also, at TR 33485 42219 estimated 300 - 500 plants in similar habitat; and at TR 3351

					4224, estimated 30 plants on chalk slope in dense Tor-grass. Overall population within 50 x 20m area. (3) A few plants on bank on north side of car park, TR 335 422. (4) TR 334 411, below Langdon Barracks in chalk grassland above the cliffs, and in spots further east.

Galium uliginosum L. (Fen Bedstraw)

vc 15 and 16

Rarity / scarcity status

Fen Bedstraw is widely distributed in the British Isles in base-rich marshes and fens and, although the species has been in decline generally since 1950, its risk status is regarded as of 'Least Concern', both in England and, more widely, in Great Britain. This decline appears also to have taken place in Kent where, however, it has always been uncommon and is currently treated as **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

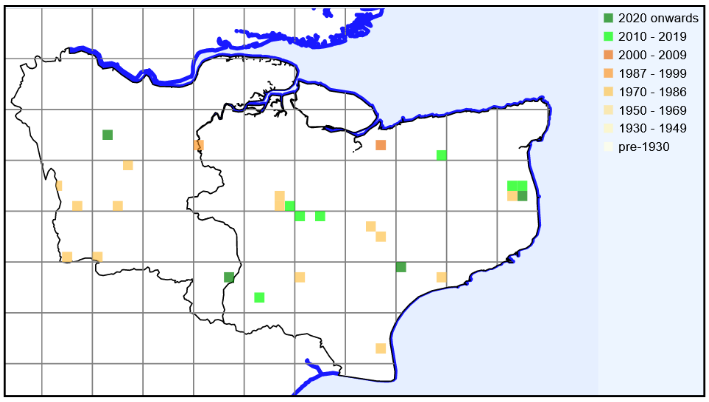
Account

The first published record in Kent is given in the third edition of John Ray's *Synopsis Methodica Stirpium Britannicarum* (1724, revised by Dillenius), 'On the *Lower Bog* at Chisselhurst; Mr. J. Sherard'[258]. Hanbury & Marshall (1899) treated it as local and rather rare, in marshes and damp ground and themselves contributed a number of records, of which Hanbury's Ham Ponds discovery at least has been persistent.

Gibbin's Brook. Photo by Lliam Rooney, 30 June, 2013

Francis Rose referred to it as a native of fens, marshes and meadows, on peat or alluvium, always on base-rich (usually calcareous) substrata; rare as a whole and only locally common. Records known to him included meadows in the Darent catchment from Brasted to Sutton-at-Hone (mostly unrecorded since, albeit re-found at Lullingstone in 2022); the Medway gap at Snodland and Holborough Marshes (unrecorded since the 1990s); the East Kent fen area (Wingham, Hacklinge, Ham, etc.); Brook, Wye; and some less characteristic places, such as the Ravensbourne estate, Mereworth, Smarden (TQ 893 406), Tuckers Pond at Angley Wood and a meadow on Gault Clay at Westwell.

By the 1971-80 survey published as Philp (1982), there were 15 tetrad records scattered across the country from extreme west to east, but the species appeared to be absent from northern Kent. In Philp (2010), however, the number had reduced to only five scattered tetrads with base-rich marsh or fen habitats (these tetrads including only one in vc16 West Kent, but now extending to a north Kent location, at Graveney), which suggests a serious decline. It does seem, however, that the trend is not quite as abrupt, given that there have been other sightings, both during the period of survey for Philp (2010) and after. The total for 2010-22 is 11 tetrads (14 monads). The lack of coincidence with the 1970s records is striking (see distribution map).



***Galium uliginosum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

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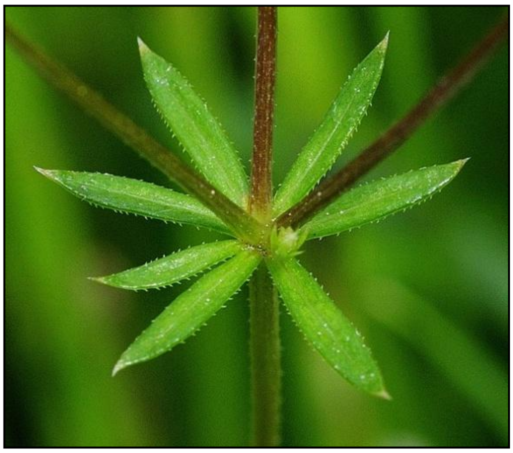
[258] This appears to be the first literature reference for the species in the British Isles, although it was collected in vc21 by Adam Buddle (died 1715).

From the name, Fen Bedstraw, one would expect the species to be found in neutral or basic wetland, with some mineral enrichment, and frequently this is the case in Kent. The old Lullingstone and Snodland/Holborough sites are directly related to river valleys breaking through the chalk downs and so subject to basic influence. The cluster of records inland of Deal and Sandwich relate to an area well-known for its peaty substrate with calcareous drainage. The species is widespread here alongside ditches, evidenced in particular by surveys in 1982 and 2003 which located it in 12 monads; this concentration is not shown so well when records are made or displayed at tetrad level only. Fen Bedstraw is also capable of growing in mildly acid conditions, especially if mineral enrichment has taken place. Its presence at Hothfield, noted in the 19th century (if correct) appears to indicate considerable acid-tolerance. The acidity may have been alleviated to a minor degree by flushing at the spring line at the bottom of the Folkestone Beds overlying the silty clay of the Sandgate Beds, but the Folkestone Beds themselves are base-poor. It is likely that the first Kent record for the species (1724), at Chislehurst, was similarly in a more acid habitat than would normally be expected for Fen Bedstraw.

Gibbin's Brook. Photos by Lliam Rooney, 30 June, 2013



Galium uliginosum in Kent is more likely to be confused with *Galium palustre* (Marsh Bedstraw) than other bedstraws. Fen Bedstraw, however, is a rougher plant to touch; its flowers are generally slightly smaller; and the backwards-directed prickles on the leaf margins are stronger. The key difference normally given is that *Galium uliginosum* leaves terminate in a small point, as distinct from *G. palustre* leaves, which are obtuse or acute. It does not help, however, that a very small mucro may occasionally be found at the tips of young *G. palustre* leaves, but the distinction will normally hold good.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Otford	TQ5258		20 June 1988	JP	Sheep pasture, TQ 527 588.
Lullingstone	TQ5364		(1) 1 July 2022 (2) 2 June 1987	(1 JP (2) JP	(1) In overgrown pond area at Lullingstone Castle. (2) TQ 5319 6454, Laundry Field, Lullingstone Castle.
Yalding Fen	TQ6849		(1) 25 July 2010 (2) 9 July 2009 (3) 17 June 1999 (4)19 September 1992	(1) KFC meeting (2) JH & JP (3) AC & JP (4) JP	(1) TQ6842 4975, regenerating plentifully by willow carr and along edge of small pond. (2) (3) TQ684493 (site reference). (4) Reserve
Snodland / Holborough Marshes	TQ76B	KWT managed reserve	(1) 1991-99 (2) 23 July 1995 (3) 23 June 1980	(1) EGP (Philp, 2010) (2) JP (3) FR	(2) TQ7062. (3) Fen meadow, north east of Snodland, TQ7062.
Angley Wood	TQ7636		(1) 23 July 2022 (2) 4 April 2021	(1) WFS meeting (SL) (2) SL	(1) Angley Wood, small fen, TQ 7604 3671. Flowering patches, not noted a month ago here when *Galium palustre* was flowering. (2) Angley Wood, small open fen in

					valley along western side of Burnt Bank Wood, TQ 7603 3671.
East Benenden	TQ8233		19 May 2011	JP	Nine Acre Wood.
Sandway	TQ8950		26 August 2018	DCh	TQ 89359 50314, widespread in boggy field next to stream
Lenham Heath	TQ9148		13 September 2011	JLa	TQ 917 489, 25 clumps in area of about 1.5 sq metre in boggy pasture near River Stour.
Charing	TQ9449		3 July 2018	JL & LS	Land to the south of the Swan Hotel, very frequent in vicinity of stream and banks.
Charing	TQ9549		(1) 14 July 2014 (2) 21 July 2001	(1) JLa (2) RM	(1) TQ 956 490, on both sides of path, in front of tall vegetation (*Filipendula ulmaria*, *Pulicaria dysenterica*, *Mentha aquatica*) and scrambling up. Patchy for about 30m. (2) TQ 9572 4909, in open fenny area of alder carr.
Charing	TQ94P		9 May 2002	EGP & DW	In Philp, 2010. May be TQ9549 location above.
Graveney Marshes	TR06R		27 March 2002	EGP & BW	In Philp, 2010.
Gibbin’s Brook	TR1138	CROW access land, SSSI	(1) 28 June 2023 (2) 6 June 2020 (3) 30 June 2013 (4) 17 July 2011 (5) 6 July 2008	(1) KBRG meeting (2) SL (3) KBRG meeting (4) KFC meeting (5) JP	(1) southern mire (2) Gibbin's Brook, TR 1159 3859 / TR 116 387. Shrinking areas of open base rich fen formed over peat in areas north and south of pond, now ungrazed, going rank and scrubbing over. (3) Widespread in taller vegetation of bogs both sides of road. Sample location at TR 1162 3868. (4) Plants scattered over fen part of fenced area between TR 11590 38611 and TR 11584 38555. Also along edge of large drying-out pond at TR 11683 38732. (5) TR1138.
Brockhill Country Park	TR1435		29 March 2012	JP	
Westbere (south)	TR1960		9 July 2017	DCh	TR 19683 60123, widespread in marshy field.
Finglesham	TR3353		2 March 1983	AH	TR 339 543.
Ham Fen	TR3354	KWT managed reserve, SSSI	(1) 17 June 2018 (2) 13 August 2016 (3) 1 August 2012 (4) 26 August 2006 (5) After 1990, before 2006 (6) 29 June 2003 (7) 2 March 1983 (8) 1982	(1) SL (2) SL (3) SB, LR and JP (4) KFC meeting (5) EGP (Philp, 2010) (6) RM (7) & (8) AH	(1) Hacklinge, west side of A258 (Ham Fen KWT), small wet cattle grazed pasture with very tall herb layer (Unit 53: Ham Fen Fields), bounded by North Stream to the east and South Stream to the north, TR 33799 54548. Not noted in adjacent pasture to the east. (2) Cattle-grazed rank fen pasture in Ham Valley, east of Finglesham (Unit 57 / South of Ham Fen Nature Reserve in the Hacklinge Marshes SSSI), TR 338 540 / TR 339 540. (3) Abundant on reserve, TR333 549. (4) TR3309 5483. (5) Recorded as TR35H. (6) TR3354. (7) TR337547. (8) TR 33390 54880, TR 33511 54784, TR 33523 54669, TR 33837 54396, TR 33885 54292, TR 33905 54118, TR 33920 54218.
Ham Brooks	TR3355	SSSI	(1) 19 July 2017 (2) 5 August 2002, 25 July 1991	(1) SB & SL (2) JP (3)AH	(1) Ham Fen. Frequent throughout a wet peaty mire centred on TR 331 552.

			(3) 1982		(2) - (3) TR 33227 55246, near Ham Brooks Wood.
Northbourne (east)	TR3452	SSSI	(1) (2) 1982	(1) SC & MLAH	(1) TR3452. (2) TR 34545 52918.
Northbourne (north east)	TR3453	SSSI	(1) 5 August 2020 (2) 21 July 2011 (3) After 1990, before 2006 (4) 2 March 1983 (5) 2003 (6) 1982	(1) & (2) SB (3) EGP (Philp, 2010 (4) AH (5) CEC (6) AH	(1) Still present by footpath across peaty grazing pasture at TR 3449 5327 (2) In fen along 35 metres of public footpath from TR 34500 53264 to TR 34535 53284. Fen vegetation was so dense elsewhere that plants might only survive where there is sufficient light along footpath. Also, Several plants in rough grass of grazing meadow at TR 34582 53307. (3) Recorded as at Northbourne Fen, TR35L. (4) TR 344 535. (5) TR 34104 53951, TR 34187 53783. (6) TR 34574 53308, TR 34856 55397.
Hacklinge	TR3454	SSSI	(1) 13 August 2016 (2) 24 July 1991 (3) 1982	(1) SL (2) FR (3) AH	(1) Cattle-grazed marshy sedge-rich fen pasture in Ham valley, on west side of A258 south of Hacklinge Farm (Unit 56 M877within Hacklinge Marshes SSSI). Area south of the dividing dyke, TR 340 542 / TR 341 542 / TR 340 541 / TR 341 541. (2) TR3454. (3) TR 34463 54497.
Worth Minnis	TR3455	SSSI	1982	AH	TR 34130 55940, TR 34648 55238.
Worth Minnis	TR3456	SSSI	1982	AH	TR 34231 56047.
Lydden Valley	TQ3555	SSSI	2003	CEC	TR 35760 55600, TR 35930 55500, TR 36835 55034.
Lydden Valley	TQ3556	SSSI	2003	CEC	TR 35540 56040.
Lydden Valley (north east Deal)	TQ3654	SSSI	2003	CEC	TR 36626 54960, TR 36446 54587, TR 36496 54916, TR 36793 54901, TR33836 54551.
Lydden Valley (east)	TQ3655	SSSI	2003	CEC	TR 36602 55465, TR 36628 55356, TR 36659 55239, TR 36416 55420, TR 36482 55107, TR 36835 55171, TR 36589 55164.

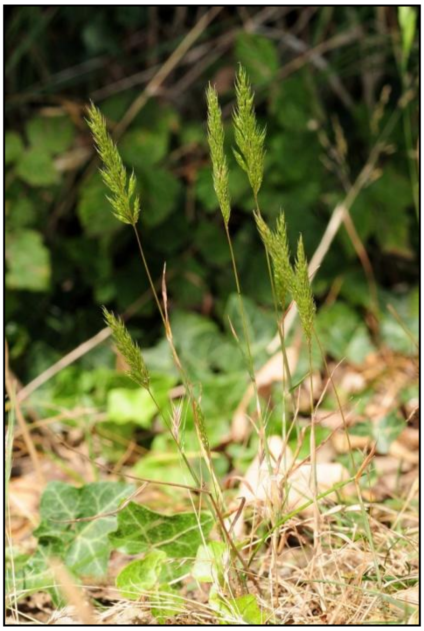
Gastridium ventricosum (Gouan) Schinz. & Thell. (Nit-grass)

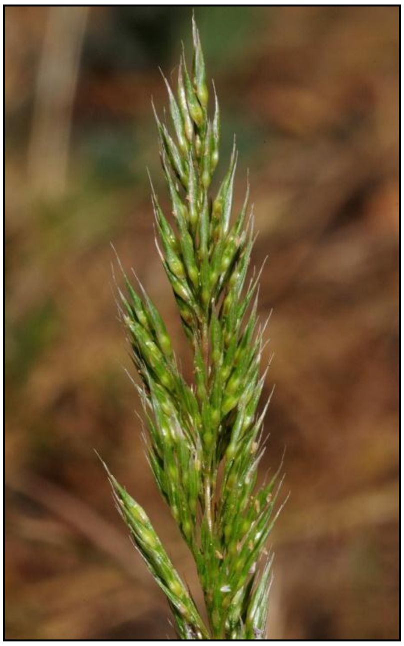
vc 15; gone from vc 16

Rarity / scarcity status

Nit-grass is an annual of south west England, south Wales and the Channel Islands, sometimes native and sometimes introduced. Overall in both England and in Great Britain as a whole, it is not regarded as attracting any particular conservation concerns, although it is currently neither common nor widespread, but is nationally **scarce**. *Plant Atlas* 2020 considers that it has gone from arable habitats (which it used to frequent) except for one site in south Hampshire, but Kent provides another. There are old records for the species in south east England, from which it has almost disappeared; but there still remains a single site in Kent. The species is therefore currently **rar**e in the county.

Account





The first recorded Kent discovery of this species appears to have been by Samuel Doody, published in John Ray's *Fasciculus Stirpium Britannicarum* (1688) as '*Near* Tunbridge Wells *in* Kent'[259]. Not all early records of plants from the Tunbridge Wells area are necessarily in West Kent (vc 16) rather than East Sussex, and it is possible that this reference was to Tunbridge Wells being in Kent, rather than the plant. However, Wolley Dod in his *Flora of Sussex* (1937) refers to E. Forster's notes of 1805 and T.F. Forster's *Flora Tonbridgensis* (1816) which respectively mention the species in cornfields between Tonbridge Wells and Eridge Rocks, and in cornfields about High Rocks; and he concludes that Nit-grass was certainly in Kent and probably also in Sussex. This would add support to the 1688 record being in Kent. The record also appears to be the first for Britain[260].

Chattenden Wood. Photos by Lliam Rooney, 9 August 2011

Early Kent records – of which there are not many – include its presence elsewhere as a weed of arable ground, Hanbury & Marshall (1899) including a reference to Nit-grass being sometimes plentiful in hop-gardens. It also appears to have been a plant of marshy coastal ground. Charles Johnson in his publication *The Grasses of Great Britain* (1861) referred to it having been at Margate in a location so wet in winter that he had more than once passed over the site by boat. Gerard Smith also recorded it, probably between 1829 and 1833, at the 'Edges of the low marshy ground above the sea shore, mid-way in Eastwear-bay'[261].

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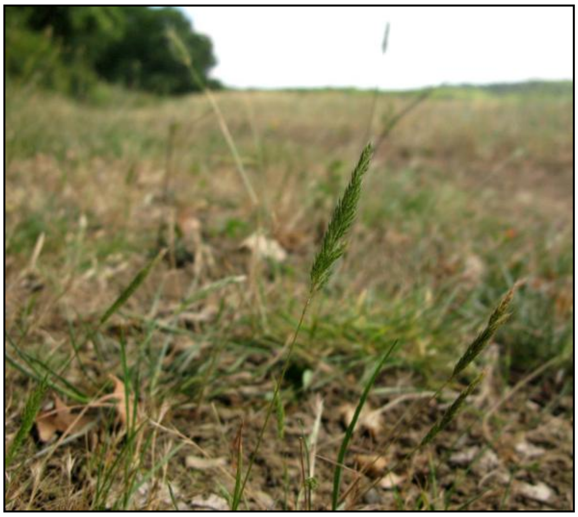
[259] This precedes what Hanbury & Marshall (1899) give as the first record, as being in William Hudson's *Flora Anglica* (1762), and also the date of 1690 given in Philp (2010) and elsewhere, which may derive from Ray's *Synopsis Methodica Stirpium Britannicarum* (1690), although this does not mention the Tunbridge Wells discovery.

[260] Trist, P.J.O. (1986). The distribution, ecology, history and status of *Gastridium ventricosum* (Gouan) Schinz & Thell. in the British Isles. *Watsonia* (16): 43-54.

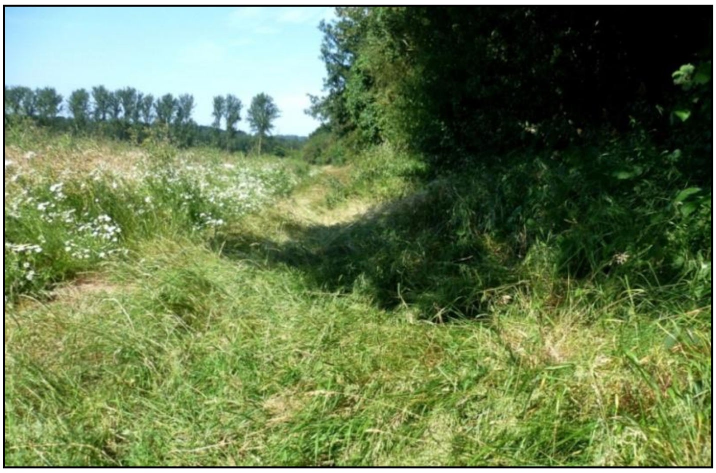
[261] In his annotated copy of his *Catalogue of rare or remarkable Phaenogamous Plants, collected in South Kent* (1829), on which M.H. Cowell drew for his version of this record in *A Floral Guide for East Kent* (1839).

Marshall (in the *Victoria History of the County of Kent*, 1908) regarded it as more plentiful in the Weald than elsewhere, probably as a result of his own finds at Staplehurst (1893) and Headcorn given in the *Flora of Kent* (1899).



Chattenden Wood, habitat.
Photo by Sue Buckingham, 9 August 2011

During the 20th century the species became rare in Kent and, with a long gap following a sighting at Chattenden Wood in 1954, where it grew in rutted woodland rides, it was re-found by Eric Philp alongside Chattenden Wood at TQ77L in the 1991-2005 survey published in Philp (2010). The location, at TQ 74297 72915, was re-visited on 9 August 2011 by Sue Buckingham and Lliam Rooney, where about 75-100 plants were seen along 5 metres of woodland edge bordering arable clay. This population is interesting, not only for its persistence, but also the replication of the habitat assessment for Nit-grass given by Hanbury & Marshall (1899), viz. local in fields and wood-borders. It is not a habitat representative of current, probably native occurrences elsewhere in Britain, where it grows in short open turf over chalk or limestone, generally near the coast. The Chattenden Wood habitat is more closely related to the species' historic status as an arable colonist, generally on clay soils, which has otherwise virtually ceased in Britain. The marginal character of the habitat may assist in providing semi-open conditions required for annual reproduction. Also, Nit-grass germinates in autumn and is apparently susceptible to frost, from which a woodland boundary may perhaps provide some protection. The field/wood margin is, however, susceptible to becoming overgrown, as may be seen from the July 2014 photograph, on which occasion, however, nine plants were found.



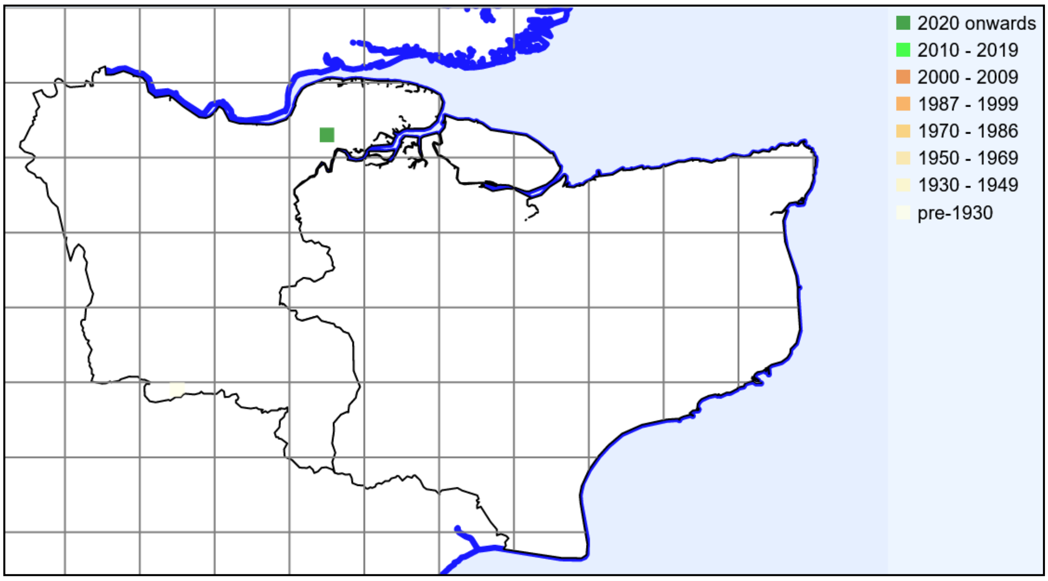
Chattenden Wood, habitat. Photo by Owen Leyshon, 4 July 2014

Chattenden Wood, habitat.
Photo by Geoffrey Kitchener, 17 July 2023

When re-visited in July 2023, however, the adjoining arable had been converted to a grass ley, and the margin adjoining the wood was much less overgrown, vegetation apparently being suppressed by rabbits and walkers, leaving much semi-bare ground exposing cracks in the London Clay from summer drought. Essentially, the habitat conditions were more similar to those in 2011 than in 2014, and the quantity of the grass was broadly similar as well. It was spread over c.9 metres of margin, partly in tree shade, between TQ 74301 72909 and TQ 74294 72904, with three plants at the first grid-reference, one at TQ 74300 72908 and numerous (probably not materially different in number from in 2011) over a 3m stretch at the second grid-reference, difficult to count because growing through other grasses, and ranging in height from low, near-prostrate to knee height. Associated species were *Agrostis stolonifera* (Creeping Bent), *Hordeum secalinum* (Meadow Barley), *Lolium perenne* (Perennial Rye-grass), *Poa annua* (Annual Meadow-grass), *Sonchus asper* (Prickly Sow-thistle) and much *Lepidium campestre* (Field Pepperwort) which was common along the field boundary generally and which, as an axiophyte and rare plant register species, indicates a worthwhile habitat.

The grass is inconspicuous and amongst other vegetation may be passed by as exhibiting contracted panicles from a distance somewhat like late-flowering *Anthoxanthum odoratum* (Sweet Vernal-grass) or even *Agrostis stolonifera* (Creeping Bent). The flower structure, however, is very distinct: the combination of awns on some of the lemmas with shiny swollen bases to the glumes supposedly suggesting nits in hair.

Gastridium ventricosum **Kent records to 2024 mapped at tetrad level, from BSBI database.**



Genista anglica L. (Petty Whin)

vc 15 (but not seen recently) and 16

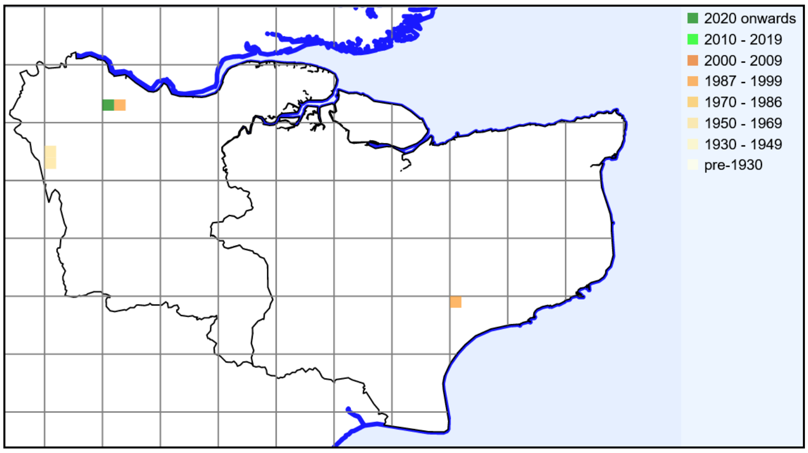
Rarity / scarcity status

Genista anglica is a small shrub which is widespread, albeit patchily distributed, in Great Britain. It appears to have been declining, perhaps due to loss of heathland habitat through agricultural improvement or becoming overgrown, and consequently in conservation terms is regarded as **Near Threatened** in Great Britain as a whole; **Vulnerable** in England. In Kent there is little heathland, and the species is **rare.** . It is a Kent axiophyte and so is indicative of good habitat.

Dartford Heath. All photos by David Steere, 10 April 2017

Account

The first published Kent record for Petty Whin is given by Hanbury & Marshall (1899) as by Edward Jacob in his *Plantae Favershamienses* (1777), in which he refers to it, without assigning a location, as ‘*Amongst Furze which grows on wet land – not common*’. However, the herbarium of Dillenius (1684-1747) contains a Tonbridge specimen which G.C. Druce credited as the first for Kent[262].



***Genista anglica* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Hanbury & Marshall (1899) treated it as a local plant of moist heaths and they mentioned records spread across the county. These included at Hayes and Keston Commons, where the species continued to be recorded until the late 1940s and early 1950s respectively. They also cited Francis Bossey’s encounter of Petty Whin at Dartford Heath in 1839, between the Folly House and Wilmington workhouse; it still persists at Dartford Heath. Hothfield is a location given in Hanbury & Marshall (1899) which survived at least until relatively recently, having been collected by Francis Rose in 1960 and being given in Philp (1982), from which it is clear that there had been searches at several other former county locations from which the plant had gone. Current populations appear to be reduced to Dartford Heath and (perhaps) Gibbin's Brook, although the latter requires confirmation of the species' continued presence.

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[262] .C. Druce (1907). The Dillenian Herbaria, Oxford. This was marked as ‘*In collibus circa Acidulas Tunbridgenses*’ (in the hills around acid [lands?] of Tonbridge), but it cannot be ruled out that reference was being made to the south of Tunbridge Wells, in Sussex

Both these locations are heathy, on sandy or gravelly soils. The presence of Petty Whin in Kent is limited by the availability of heathland habitat, maintained open. As the species does not normally grow higher than 50cm, it is readily capable of being crowded out by *Ulex europaeus* (Gorse), which grows in similar places. In the absence of grazing, other than by rabbits, heath fires may act as a gorse suppressant, enabling Petty Whin to flourish, as was noted in 1989/90 at Dartford Heath. The effect of fire is also to increase germination.[263] It is a patch-forming species and so individual plants are not readily countable.

Petty Whin is not readily confused with other species in Kent. *Ulex minor* (Dwarf Gorse) may grow in similar habitats (it is present on Dartford Heath) but has branched spines, more crowded than the sparse spines of *Genista anglica*.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
[Hawkenbury Bog]	[TQ5937]		[After 1970, before 1981]	[Philp, 1982]	Then a few plants, but lost some time after 1976 as a result of changes in the habitat. This site, however, was in vc14, East Sussex.
Dartford Heath	TQ57B & TQ57G	Dartford Borough Council managed open space	(1) 30 December 2023 (2) 6 April 2019 (3) 10 April 2017 (4) 16 May 2010 (5) After 1990, before 2006 (6) 17 June 1997 (7) 27 April 1997	(1) DCh (2) & (3) DS (4) KFC meeting (5) EGP (Philp, 2010) (6) JP (7) RMB (8) RMB	(1) Healthy and apparently spreading, with nearby gorse having been cut back. (2) TQ5173, single patch in usual location: however, getting smaller and looking less healthy each year that passes. Encroaching *Ulex europaeus* had been cut back. (3) TQ5173, usual site.

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[263] Hanley, M.E. (2009). Thermal shock and germination in North-West European Genisteae: implications for heathland management and invasive weed control using fire. *Applied Vegetation Science* 12: 385-390.

			(8) 1990 (9) 1990	(9) JRP	(4) TQ 51290 73143, scattered over heathy area of 7 x 10m. Area is maintained clear, but *Ulex europaeus* has been closing in on surrounds, and there are also brambles, birch and hawthorn springing up. (4) Both TQ57B & TQ57G. (5) TQ524734. (6) TQ 5121 7313, flowering well. (7) TQ 511 733. (8) TQ57B; very prolific after gorse above it burned back in 1989
Hothfield	TQ94S	KWT managed reserve, SSSI	(1) After 1970, before 1981 (2) 12 May 1974	(1) Philp, 1982 (2) BEW	(1) Scattered plants. (2) TQ9645. [Not found where indicated by KFC Bulletin accounts, SL, 2016.]
Gibbin's Brook	TR13E	CROW access land, SSSI	1991-99	EGP (Philp, 2010)	

Genista tinctoria L. (Dyer's Greenweed)

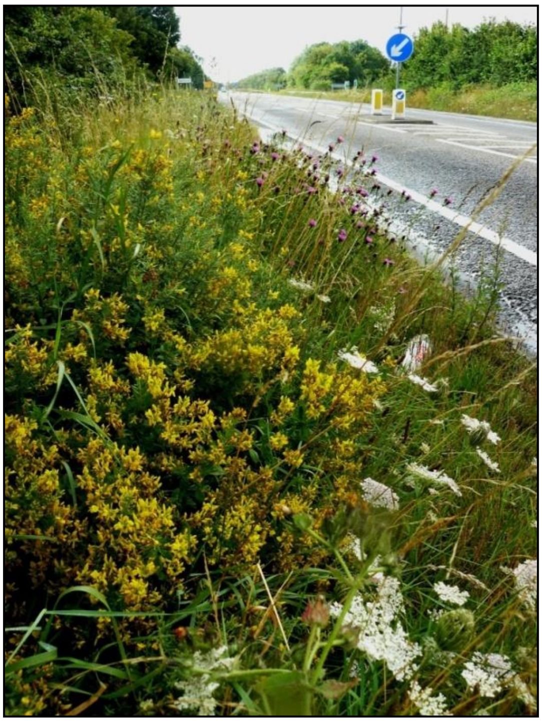
vc 15 and 16

Rarity / scarcity status

Genista tinctoria is a locally common, low-growing shrub widespread in England and Wales, just reaching into south Scotland. Its conservation status in Great Britain overall is regarded as of 'Least Concern', but in England there is sufficient evidence of decline for it to be treated as **Vulnerabl**e to the risk of extinction in the wild. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 38% in the likelihood of recording the species. In Kent, the decline in tetrad records between 1971-80 and 1991-2005 given in Philp (1982) and Philp (2010) has been 53% but subsequent recording indicates that the decline has not been quite as extensive. It is uncommon in Kent but not as yet rare or scarce. As a Kent axiophyte, it is an indicator of good habitat.

Account

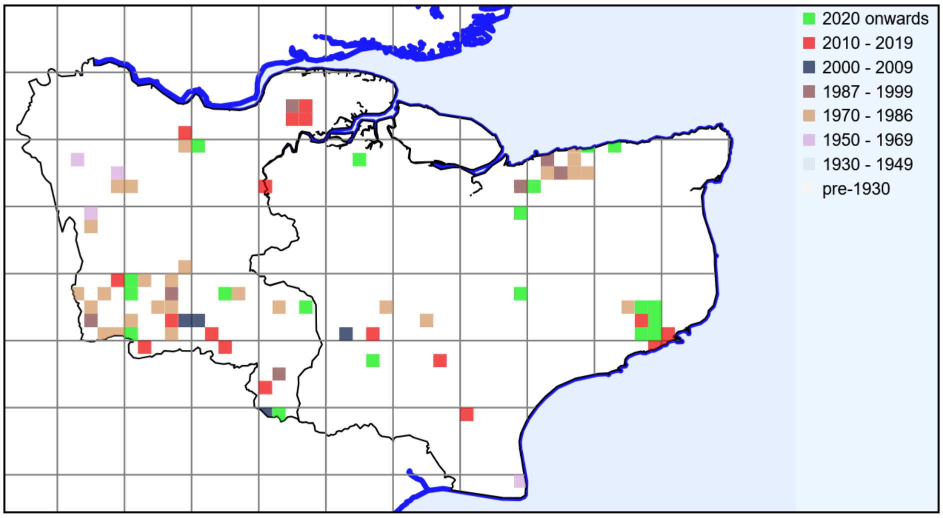
Hanbury & Marshall (1899) gave the first published Kent record of Dyer's Greenweed as by Edward Jacob in his *Plantae Favershamienses* (1777), where he refers to it as '*in the Marshes near* Holly Shore — *not common*'. This location is now known as Hollowshore, near the junction of Oare and Faversham Creeks. However, the first record was instead made by Thomas Johnson in his *Iter Plantarum* (1629). Johnson encountered it as *Genestella infectoria* in an after-dinner journey from Stoke to Cliffe, via High Halstow and Cooling, his exhausted companions, bar one, having given up botanising in favour of a lift to Rochester in a brewer's dray. Francis Rose, in the 1972 edition of that work, remarks that the species was still abundant south of Cliffe. Hanbury and Marshall noted a series of records near the north Kent coast, also in the Dover/Folkestone area and a scattering across the Weald, with occasional occurrences elsewhere. They ranked it as frequent in several districts and to be found in fields, banks and wood-borders, usually on clay.



Snave. Photo by Heather Silk, 27 August 2012

Broadly speaking, that distribution has continued, although there have been many apparent losses since the 1930s. Philp (1982) treated the species as rather local, echoing Hanbury and Marshall's reference to fields, banks and wood-borders; and noting that it was occasionally to be found on chalk or sand, albeit usually on clay. The total of 45 tetrad records for the 1971-80 survey, however, had reduced to 21 by 1991-2005, and Philp (2010) considered that there had been some loss of habitat —rough pastures, old meadows and grassy roadside banks.

The greatest concentration of records in Philp (2010) is in the Dover area, from the coastal chalk cliff-top grassland running inland towards Lydden and the downland slopes of the NNR. This habitat is probably less at risk than rough pasture or old meadow habitats. If the latter are equated with neutral grassland habitat, then the Kent Habitat Survey (2003) shows an overall habitat decline from 6% total county coverage in 1995 to 3.2% in 2003, which occupies the core period of recording in Philp (2010) and is particularly evident in the Weald. However, the neutral grassland category is a wide one (12,850 hectares in 2003), and a closer match for potential Dyer's Greenweed habitat would be provided by the 71 hectares of lowland hay meadow and 587 hectares of species-rich 'other neutral grassland' recorded by the 2003 Kent Habitat Survey. The best focus perhaps is provided by the UK (former) BAP designation of Lowland Meadow priority habitat, for which *Genista tinctoria* is one of the indicator species to qualify for designation. The amount of such habitat and changes in it are not easy to interpret. This is because, although the 2012 Kent Habitat Survey found just 27.7 hectares of Low land Meadow priority habitat out of the county's 28,531 hectares of neutral grassland[264], a subsequent validation exercise added 429 hectares of Lowland Meadow. It is also because a related change analysis[265] showed both losses and gains between the 2003 and 2012 Habitat Survey, but although the gains appeared to outweigh the losses, this may have been an artefact of the survey methodology. We can, however, conclude that there is very little Lowland Meadow left in the county; that much of what there is lies in the Weald; that gross losses (of 121.3 hectares) between the 2003 and 2012 Kent Habitat Surveys were attributable to a change to neutral grassland (implying a loss of species richness, probably due to management changes, such as cessation of grazing resulting in rank vegetation) and a very small proportion to woodland (implying scrubbing over, if not planting).



***Genista tinctoria* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The records for 2010-24 show a total of 37 tetrads (46 monads) as compared with 21 tetrads in Philp, 2010) and so well exceeding the coverage found for the county in 1991-2005, but still showing a decline from the 1971-80 total of 45 tetrads. The broad distribution has similarities, but the individual sites are often different, not just in relation to the 1991-2005 distribution, but also in relation to that for 1971-80 (included under the 1970-86 date class depicted in the tetrad map above). There are two concentrations of 1970s-90s records which have limited or no corresponding recent ones: south west Kent and the Whitstable / Herne bay area. This is surprising for a species which might be regarded as growing in habitats with historic continuity, rather than acting as a colonist.

A more detailed map of recent records is given at monad level below. Because recording at monad resolution only became the norm in Kent from 2010, the monad mapping largely omits historic records. The 2010-22 records illustrate distinct habitats, albeit all grassland. They include the Dover records on chalk grassland, whether coastal on cliff-tops or inland on downland slopes (plant community CG5, *Bromopsis erecta-Brachypodium pinnatum* agg.). There are also roadside records on varying soils without discernible distribution pattern, nor necessarily of a character which suggests preservation of old grassland (e.g. the species has been recorded on the highway bank of the A2070 near Snave apparently created by highway widening/reconstruction from the early 1990s onwards, and by the A21 near Pembury it is present by a widened slip-road at its junction with a modern road route).

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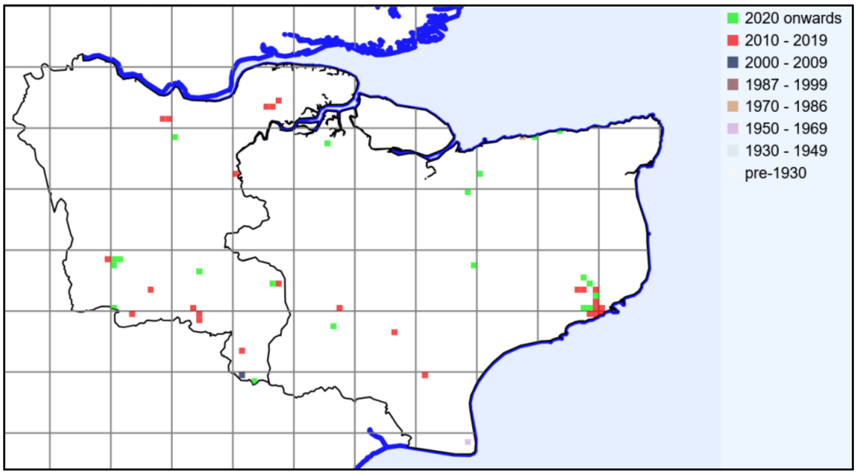
[264] *ARCH Kent Habitat Survey 2012 Final Report*, Results 5.2.5.3.

[265] *Change Analysis of UKBAP priority habitats 2003-2012*. http://www.archnature.eu/assets/files/Activity%201/ChangeAnalysisUKBAP_habitats2003_2012.pdf



***Genista tinctoria* Kent records to 2024 mapped at monad level, from BSBI database.**

There is a record for rough grassland by a brackish dyke near Reculver, which echoes Edward Jacob's old Faversham discovery. This is comparable with its abundant presence in relic grazing marsh near Lower Halstow near a brackish dyke, and on a neighbouring sea defence embankment. Also, there are records in grassy fields on clay in the western Weald, such as at Polebrook Farm SSSI, where the field layout is believed to go back at least seven hundred years and *Genista tinctoria* grows accompanied by plants of long-established grassland such as *Anacamptis morio* (Green-winged Orchid) and *Ophioglossum vulgatum* (Adder's-tongue).

Beacon Wood, Bean. Photo by David Steere, 18 July 2013

Genista tinctoria is a non-spiny perennial shrub of which two subspecies grow in the British Isles. Our Kent plant is subspecies *tinctoria,* which is supposedly erect or ascending, the other British subspecies, *littoralis*, being prostrate with wider leaves. Where grazed or cut back, however, subsp. *tinctoria* appears low-growing. In Kent, the species is unlikely to be confused with other plants, at least when in flower. Dyer's Greenweed is a traditional dye-plant, affording a yellow dye; but there does not appear to be evidence of its cultivation in Kent for this purpose, unlike *Reseda luteola* (Weld or Dyer's Rocket), which was cultivated in the 16th, 17th and 18th centuries, especially in north east Kent, as a yellow dye-plant[266], although also available in the wild. In addition to Weld, *Isatis tinctoria* (Woad) and *Rubia tinctorum* (Madder) appear to have been the principal dyestuffs grown in Kent.[267] *Genista tinctoria* does not seem to have been regarded as of the same standing, although it should have been readily available in the wild for the Kent woollen broadcloth industry in the Weald, encouraged by Edward III.

Staplehurst/ Marden, habitat (lowland neutral meadow). Photo by Lesley Mason, 1 June 2011

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[266] J. Thirsk (1997). *Alternative Agriculture; a history*.

[267] T. Young (2013). *Clothes and Domestic Textiles in the Community of Staple and its Environs: Constructing the Forgotten Fabrics of the Sixteenth Century Yeoman*. Ph D thesis, University of Southampton.

Gentianella amarella (L.) Börner subsp. *amarella* (Autumn Gentian)

vc 15 and 16

Rarity / scarcity status

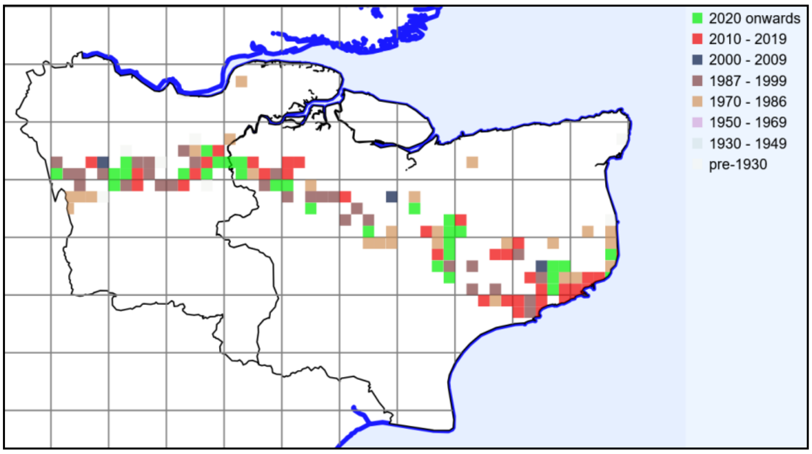
Gentianella amarella subsp. *amarella* is distributed widely over the British Isles where well-drained basic soils are present, and in Great Britain as a whole its conservation status is regarded as one of 'Least Concern'. In England, however there is some evidence of decline, and it is considered to be **Near Threatened**. This risk assessment is based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 21% and its area of occupancy had declined so that there was a 24% reduction in the likelihood of recording the species. In Kent it is not yet rare or scarce, but has exhibited a decline in tetrad records of 40% between 1971-80 (Philp, 1982) and 1991-2005 (Philp, 2010). As a Kent axiophyte, it is an indicator of good habitat.

Burham. Photo by David Steere, 3 August 2014

Account

The first published Kent record for Autumn Gentian is by Thomas Johnson in his *Iter Plantarum* (1629). On 16 July 1629, he found it at Chalkdale, a former quarry from which chalk had been extracted for quick-lime, in the company of many rare and beautiful plants, apparently a classic chalk flora. The species was commented on by a number of subsequent authors in botanising on chalk in the county: Gerard Smith (*A catalogue of rare or remarkable phaenogamous plants collected in South Kent*, 1829) noted it as abundant upon turf and dry chalky spots: 'The variety with a single flower may frequently be gathered: in favourable situations this plant presents an acute cone of flowers; most elegant, from the saffron green color [sic] they acquire, when dried'. Hanbury & Marshall (1899) regarded *Gentianella amarella* as common on the chalk, in dry pastures, etc.

Francis Rose treated it as a native of chalk grassland, very common and very general: a species of "high fidelity" in this habitat in Kent; unknown off the chalk, except for an ancient Sheppey record. Philp (1982) gave Autumn Gentian as common on chalk downland, chalk quarries and roadside banks on the chalk and present in 97 tetrads, almost entirely confined to the North Downs, a chalk band running across the county, widening out in the east to show concentrated presence from Walmer to Folkestone and inland. This last area appeared much depleted in the 1991-2005 survey published in Philp (2010), in addition to a general thinning out of occurrences, and the total number of tetrad records had reduced to 58.



***Gentianella amarella* Kent records to 2024 mapped at tetrad level, from BSBI database.**

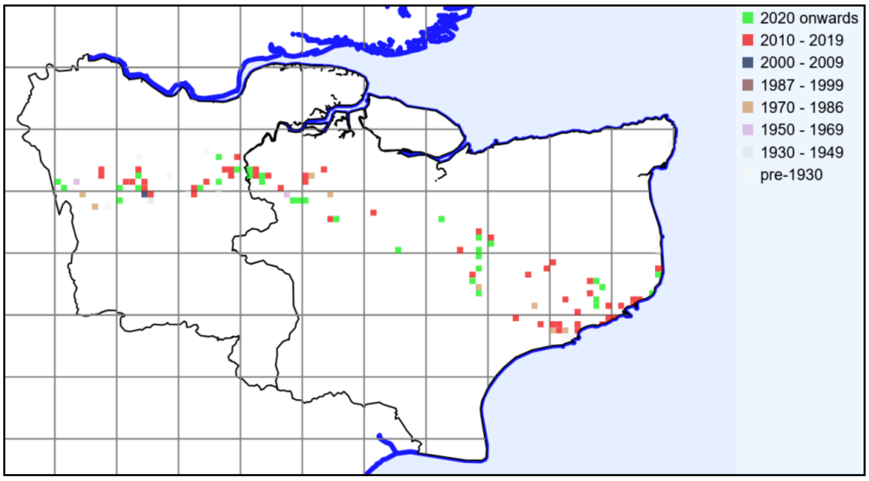
This thinning out is demonstrated by the distribution map above, with squares coloured other than green and red indicating tetrads where the species has not been recorded after 1999.

No cause of decline was noted, but it appears to be shared by some unrelated species also confined to the chalk: between Philp (1982) and Philp (2010) tetrad records *of Poterium sanguisorba* subsp. *sanguisorba* (Salad Burnet) declined by 26% and *Thymus polytrichus* (Wild Thyme) by 70%. This suggests that the cause is a general one, capable of affecting all, and that either habitat changes or an artefact of the recording process are possible explanations.

Devil's Kneading Trough, Wye. Photo by Lliam Rooney, 21 September 2010

Whilst historically, much loss of chalk downland came about through agricultural changes or scrubbing over, the effect of myxomatosis on rabbit grazing being significant, it does not seem straightforward to equate further decline with the reduction in tetrad records of Autumn Gentian and other chalk grassland species. The Kent BAP for 1997 recognised 1503 hectares of unimproved chalk grassland; the Kent Habitat Survey (2003) gave 1658 hectares of lowland calcareous grassland; and the Kent Habitat Survey (2012) identified 1929 hectares of calcareous grassland (of which 1159 hectares was unimproved). Change analysis[268] for the period 2003-2012 in relation to lowland calcareous grassland (BAP priority habitat) identified losses, mostly to woodland and neutral grassland, but also over-compensating gains, mostly from improved grassland, neutral grassland and crop. The differing definitions of grassland used at various times obscure identification of trends relevant to the periods of county botanical survey, although it looks as though there could have been a decline in better quality habitat during the later part of the 1991-2005 botanical survey, but that there has been an improvement in total BAP priority habitat since.

The records for 2010-24 show a total of 65 tetrads (85 monads)[269]. If one excludes Greater London (not covered by Philp, 1982 and 2010), then the total is 63 tetrads, more or less equivalent to the total of 58 tetrads given by the 1991-2005 survey and so not suggesting any continuing decline.



***Gentianella amarella* Kent records to 2024 mapped at monad level, from BSBI database.**

Gentianella amarella is a biennial, rarely annual, normally resting as a bud during winter and flowering in August and September (hence Autumn Gentian) in grazed, or otherwise short, turf in open habitats. It is fairly short, to 30 (50 or more) cm, but generally much shorter, and requires opportunities to re-establish itself by seed, or it may be crowded out by rank vegetation or scrub growth. Long seed dormancy and changes in available open ground would account for the tendency of the species to 'move around' within an area.

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[268] *Change Analysis of UKBAP priority habitats 2003-2012*. http://www.archnature.eu/assets/files/Activity%201/ChangeAnalysisUKBAP_habitats2003_2012.pdf

[269] Totals and maps give records for *Gentianella amarella* excluding *Gentianellla amarella* subsp. *anglica*, which has a separate account in this register. Other subspecies are not Kentish plants, and all Kent records for plain *Gentianella amarella* are taken as subsp. *amarella.*

The taxonomic position of this and related *Gentianella* species is not straightforward, but from a Kent viewpoint there are only three issues to be considered. The first of these is the relationship with *Gentianella anglica* or *Gentianella amarella* subsp*. anglica* (Early Gentian) – see the separate account in this register. The second issue is a historic one, that *Gentianella germanica* (Chiltern Gentian) appears to have been formerly present in the county, leaving traces by way of hybrids with *Gentianella amarella* collected in 1885 from a chalk bank at Lyminge and in 1902 from a similar habitat at Deal[270]. The third issue is entirely historic: the need to disregard old claims for the northern species, *Gentianella campestris*, as indeed did Hanbury & Marshall (1899).

Polhill Bank, habitat.
Photo by David Steere,
19 July 2014

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[270] A. McVeigh, J.E. Carey & T.C.G. Rich (2005). Chiltern Gentian, *Gentianella germanica (Willd.*) Börner (Gentianaceae) in Britain; Distribution and current status. *Watsonia* **25**: 339-367.
The former presence of *G. germanica* is not surprising, and Francis Rose remarked that 'on the chalk downs of the Pas de Calais it entirely replaces *G. amarella*, occurring within about 23 miles of the Dover cliffs on the chalk downs above Cap Blanc Nez (1959!); *G. amarella* in N. France is confined to calcareous sand dunes. It is therefore most remarkable that *G. germanica* is absent from SE England S. of the Thames'.

Gentianella amarella subsp. *anglica* (Pugsley) T.C.G. Rich & McVeigh (*Gentianella anglica* (Pugsley) E.F. Warb.) (Early Gentian)

vc 15 and 16

Rarity / scarcity status:

Gentianella amarella subsp. *anglica* is a plant of short calcareous grassland in southern England and Wales, and grows nowhere else in the world. Its taxonomic status has been questioned, but has been recognised sufficiently to be treated as **Vulnerabl**e to the risk of extinction in Great Britain. As an endemic, it it is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. It is protected under Schedule 8 of the Wildlife and Countryside Act 1981 and despite the uncertainties of its species status, it was also classified as a European protected species, which led to it being afforded the protection of The Conservation of Habitats and Species Regulations 2010, now the 2017 regulations. In this account, it is treated as a subspecies, following the fourth edition (2019) of Clive Stace's *New Flora of the British Isles* and *Gentians of Britain and Ireland (*2019) by Tim Rich and Andy McVeigh. Ii is **nationally scarce** and in Kent is also **scarce**.

Account:

The Early Gentian was first described as a separate taxon in 1883, from the Isle of Wight, but was treated as part of the *Gentiana amarella* (Autumn Gentian) aggregate until carved off as a separate species in 1936. Its first discovery in Kent was by Francis Rose and David McClintock on 12 May 1946. They found two plants on a chalk grassland slope at the downs above Kemsing, TQ5559. Searches in 1947 and 1948 yielded no result and subsequently the downland became heavily scrubbed up. When revisited by the Kent Field Club in 1971, the site was found to have been cleared, scraped, ploughed and put to grass, whilst 'dosed with chemicals'[271].

Magpie Bottom. Photo by Fred Rumsey, 26 May 2013

The presence of the taxon in Kent has been examined thoroughly by Tim Rich and Eric Philp (1995)[272], considering its history in seven sites: at Kemsing Down, Shoreham Downs, Trottiscliffe, Eccles, Wye Downs, Dover and St. Margaret's Bay. Since then, three new sites have been reported: Shorehill at Kemsing, Magpie Bottom near Shoreham and another site at Dover. All these new sites are broadly within the scope of the previously known distribution, along the North Downs.

Early Gentian grows in Kent on calcareous ground, generally on south or south-west facing slopes, which suggests a need for light and warmth; and many of its sites also contain a species-rich chalk grassland flora, including orchids. It is considered to be a biennial, perhaps annual at times, and so requires a degree of open ground for establishment, perhaps facilitated by sloping terrain. It is a short plant, and benefited by short turf with open patches. It is distinguished from 'normal' *G. amarella* by its early flowering (said to be from March, although we have no Kent record earlier than May), but there is potential overlap with *G. amarella* from July; and by the number of internodes and proportionate length of the apical pedicel. Early Gentian is treated as having 0-3(4) internodes and an apical pedicel which is less than 35% of the total plant height to the top of the pedicel; 'normal' *G. amarella* has (2)4-9(11) internodes and an apical pedicel which is at least 40% of the total plant height.

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[271] David McClintock (1972). Gentianella anglica, *Kent Field Club Bulletin* **17**: 36-37.

[272] Tim Rich & Eric Philp (1995). Early Gentian (*Gentianella anglica*) in Kent in 1994. *Plantlife project report no.48.*

The history of its Kent occurrence is largely one of the discovery of one or very few plants at a location where it cannot be found in subsequent years, even when the follow-up is sufficiently quick that the habitat ought not to have changed materially. The most constant populations have been at Trottiscliffe, but there the plants have been interpreted as mostly hybrids. This enigmatic come-and-go behaviour, coupled with the Early Gentian's tendency to grow with *G. amarella* subsp. *amarella* has encouraged differing views as regards the taxon's status. David McClintock, the co-finder of the first county record, considered that the taxon in Kent might only be an incipient species, derived from *G. amarella*, but at least in Kent not of sufficient viability to sustain itself.

Eric Philp (in Philp, 2010) took it, at least in Kent, to be merely an early flowering form of *G. amarella*, on the basis that in some years, a few seeds germinate earlier than normal. As *G. amarella* subsp. *amarella* appears normally to germinate in spring and then to overwinter and flower in the following year, it may be that he was suggesting that the early flowering form was an annual, germinating in early spring (or perhaps the previous autumn, in spite of the limited time to form a rosette and an overwintering underground bud) to flower in May/June. He mentions the Trottiscliffe site as apparently exhibiting good *G. anglica* in May, then in mid-June showing flowers which Tim Rich interpreted as mostly *G. anglica x amarella,* and then later in the year carrying flowers entirely of good *G. amarella*. This observation was set out in the context of Eric Philp's view that *G. anglica* was not a good species; but it is entirely compatible with what one might expect in a population of mixed species with hybrids. On the other hand, if the underlying genetic resemblance between all the individuals in such a population is sufficiently identical that they might be regarded as a single species, then this observation would indeed be one demonstrating a range of variability of *G. amarella*.

Dover, habitat. Photo by Owen Leyshon, 11 June 2013

This has support, in that Winfield & Parker (2000)[273] and Winfield et al. (2003)[274] refer to genetic analysis of non-Kent material indicating that *G. anglica*, *G. amarella* and *G. uliginosa* are all closely grouped (separately from *G. campestris* and *G. germanica*) and that individuals of *G. anglica* and *G. amarella* in mixed populations were genetically more similar to each other than they were to individuals of the same species in different populations. This last study concludes that *G. anglica* may be no more than a form of *G. amarella* that has been created and maintained as a consequence of former grassland management practices, with sheep grazing applying selective pressure for early and late flowering forms.

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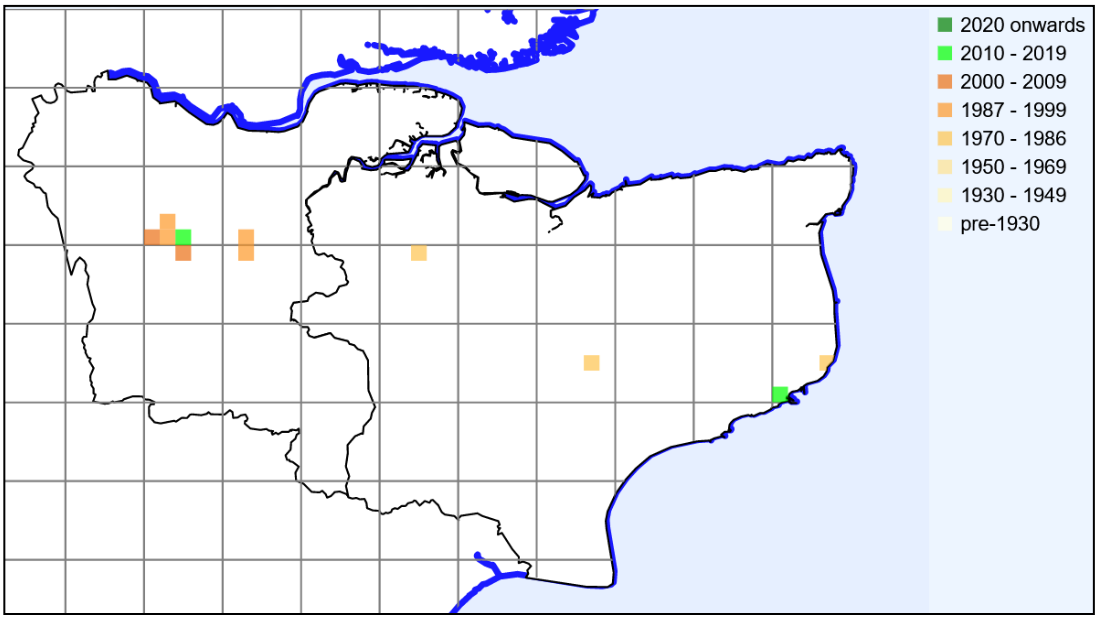
[273] M. Winfield & J. Parker (2000). A molecular analysis of *Gentianella* in Britain. *English Nature / Plantlife report no. 155*.

[274] M.O.Winfield, P.J. Wilson, M. Labra & J.S. Parker (2003). A brief evolutionary excursion comes to an end: the genetic relationship of British species of *Gentianella* sect. *Gentianella* (Gentianaceae). *Plant Syst. Evol.* **237**: 137-151.

On the other hand, the plant still exhibits differences in appearance and behaviour from ‘normal’ Autumn Gentian such that there is value in maintaining some taxonomic differentiation, at least at subspecific level, which is the current consensus.

Gentianella amarella **subsp.** ***anglica*** **Kent records to 2024 mapped at tetrad level, from BSBI database.**



Site	Grid reference	Site status	Last record date	Recorder	Comments
Shoreham Downs	TQ5261	SSSI	May 1994	SB, EGP, GK	TQ 529 611 (a more accurate reference than originally given), a west-facing chalk downs slope, with scrub recently cleared from vicinity. One plant found by SB with W.E.A. class on 14 May 1994; two more seen by SB & GK on 21 May 1994; one plant and six possible young ones seen by EGP on 30 May 1994. Not found, 1995 (EGP & TCGR).
Shorehill Down, Kemsing	TQ5459	KWT and Parish Council nature reserve	8 June 2006	JP	TQ 548 593, one plant in bud. South-facing chalk downs slope, a similar location to the original Kemsing location, but further west.
Magpie Bottom	TQ5461		(1) 26 May 2013 (2) 9 June 2009	(1) & (2) FJR	(1) Two plants, at TQ 5440 6120 and TQ 5441 6119, on south-west facing chalk downland side of dry valley on North Downs dip slope. Growing near *Polygala amarella* in an area differentiated by some broken bare ground and the presence of rosette-growing plants and finer grasses than in the general neighbourhood. (2) One plant, identified from accidental inclusion in photograph of *Polygala amarella*.
Kemsing Down	TQ5559	KWT and Parish Council nature reserveR	1946	FR & DMC	See text of account above. Inferred to have been at Greenhill.

Trottiscliffe, Wrotham Water	TQ6260	SSSI	(1) 1995 (2) 3 May 1993 (3) 1992 (4) 18 June 1988 (5) 27 May 1980	(1) TCGR (2) EGP (3) TR (4) AB (5) PWh	This location is a south-west facing steep grassland slope on the North Downs scarp. (1) The population appeared predominantly intermediate with *G. amarella*, and about 30 plants in two groups were taken to be the hybrid, with three to five plants being *G. anglica.*[275] (2) TQ 629 605, two flowering plants with three probable young plants. (5) TQ 629 605, one plant.
Eccles	TQ7261		7 June 1994	EGP	One possible plant at the edge of a clay pit amongst much *G. amarella*, TQ 725 611. May have been an early flowering *G. amarella* with a virtually non-existent terminal internode[276]. Not found, 1995 (EGP).
Wye Downs	TR0745	SSSI	16 June 1984	JPu	One plant. Not found, 1995 (EGP). It is possible that this was an early flowering of *Gentianella amarella* subsp. *amarella* (Autumn Gentian) by way of response to an earlier injury (suggested by TCGR on enquiry by AL).
Dover (west)	TR3141		11 June 2013	KBRG meeting	Two flowering plants and one probable non-flowering rosette at TR 31358 41025 and TR 31359 41015, on steep chalk slope with associated rich flora including *Anthyllis vulneraria*, *Lotus corniculatus*, *Arabis hirsuta*, *Bromopsis erecta*, *Briza media*.
Dover (east)	TR34424	SSSI	5 May 1980	RB	TR 341 422, one plant on chalk cliffs above Dover Harbour. Not found 1984, 1986 and 1994 (although some areas with shorter turf may be suitable).
St Margaret's Bay	TR3744	SSSI	22 June 1974	JK	TR 373 449, one small plant, short turf on cliff-top footpath. Not found 1994 (TCGR) and on previous occasions (EGP). Limited suitable ground except cliff edge.

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[275] P.J.Wilson (1999). The distribution and Status of *Gentianella anglica* (Pugsley) E. Ward. *Plantlife report no. 119*. Also, T.C.G. Rich, D.T. Holyoak, L.J. Margetts & R.J. Murphy (1997). Hybridisation between *Gentianella amarella* (L.) Boerner and *G. anglica* (Pugsley) E.F. Warb. (Gentianaceae). *Watsonia* **21**: 313-325.

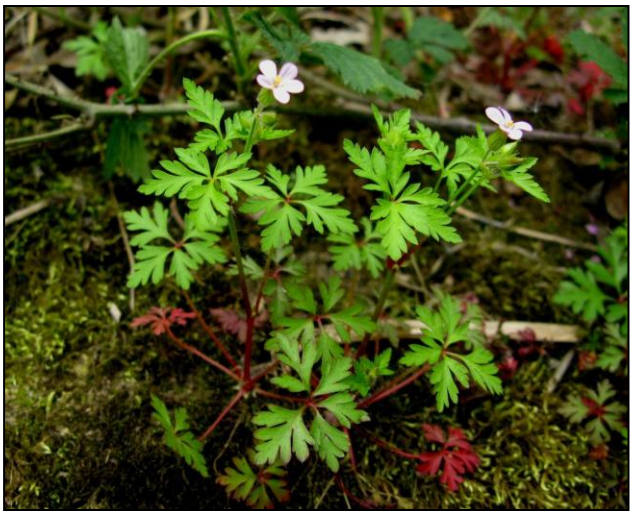
[276] T. Rich *et al.* (1996). Early Gentian (*Gentianella anglica)* in 1995: now you see me, now you... *Plantlife project report no.59.*

Geranium purpureum subsp. *purpureum* Vill. (Little-Robin)

vc 15 and 16

Rarity / scarcity status:

Little-Robin is an annual of south west England and southern Ireland growing near the sea (and in the case of subp. *forsteri*, on shingle beaches). There is also a relationship with railway ballast which accounts for occurrences as widespread as Nottinghamshire, south Wales and East Sussex. It is local, but not uncommon in its core coastal distributional areas in West Sussex, Hampshire, Devon and Cornwall. It conservation terms, its risk status is one of 'Least Concern' both in England and in Great Britain as a whole, even though it is **nationally scarce**; but in Kent, which is outside its normal range, the species is uncommon, but no longer scarce.



Haysden. Photo by Sue Buckingham, 23 April 2011

Account:

Hanbury & Marshall (1899) under their account of *Geranium robertianum* (Herb-Robert) give records for a taxon named 'c. *purpureum*' for which there were a number of sightings on shingle beaches, beginning with J.T.B. Syme's record at Kingsdown mentioned in English Botany (vol. 2, 1864, 3rd edition), which equates his var. γ *purpureum* with *G. purpureum.* Syme seems to have been the source of the general confusion in older literature between *G. purpureum* and the prostrate maritime form of *G. robertianum*. Purported occurrences of *G. purpureum* on Kent coastal shingle can generally be discounted as being *G. robertianum* instead, but there has been a find on Folkestone shingle in 2023, discussed further below.

Holborough, habitat. Photo by Geoffrey Kitchener, 19 June 2012

Subject to an unconfirmed vc15 record, the first occurrences of this species in the county have been railway-related, and likely to be introductions related to railway ballast. Rodney Burton found it on the railway tracks at St Mary Cray station in 2002, where still present in 2017 (albeit not seen 2005-16, nor after 2017), and drew attention[277] to an analogous occurrence in Germany. It is also mentioned in the Sussex rare plant register as having been present on railway tracks at Lewes station, despite spraying.

In 2007 it was found by Sue Buckingham below a railway bridge at Haysden and subsequent observations have shown it to be present elsewhere on the railway line itself. An occurrence 850m south of the railway raises questions as regards the means of dispersal, given that the explosive capsule ejection in *Geranium* spp. Is normally limited to a few metres, and attachment to a bird or animal may be implied. The plume of suspensory fibres on the mericarps are readily capable of adhering to any surface, and being transported. A 2012 discovery at Holborough is about 60m from a railway, but the species has not been found there on the railway itself. Also, in 2017, Lliam Rooney found plants by a railway foot bridge at Faversham station (the species has subsequently been found to be more extensive around Faversham). A 2018 find was by the access to Orpington station staff car-park. Finds in 2022 at Longfield and Swanscombe may be regarded as related to railways, but within a range of 40 to 210m from the railway formation at the former site and within 250m at the latter. Occurrences in 2010-24 amount overall to 17 tetrads (19 monads).

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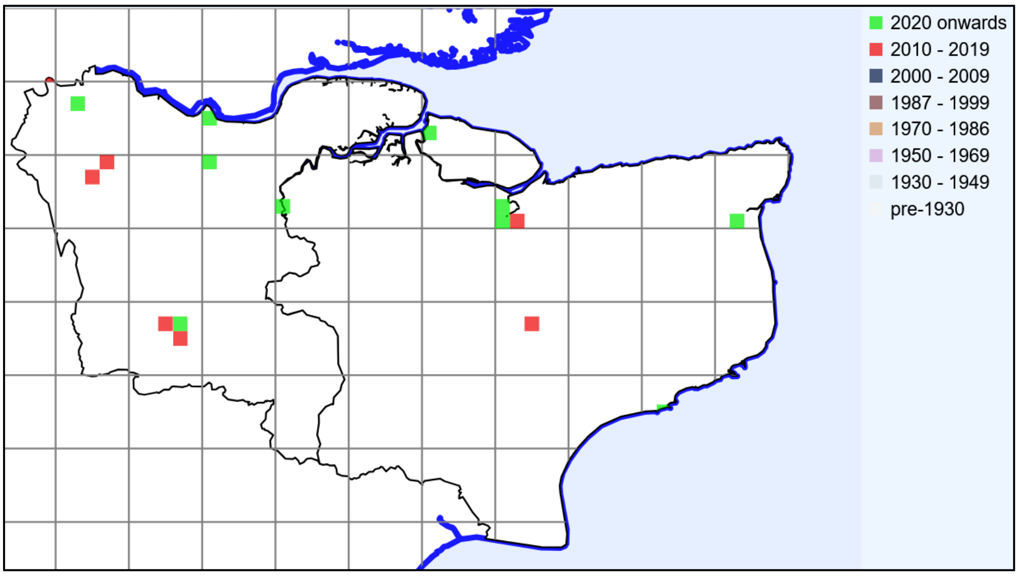
[277] R.M.Burton (2003). Botanical records for 2002, in (ed.) K.H. Hyatt, *The London Naturalist* **82**: 253-260. For railway associations in the Czech Republic, see also Pyšek, P. **et al**., 2012. Catalogue of alien plants of the Czech Republic (2nd edition): checklist update, taxonomic diversity and invasion patterns. *Preslia* **84**: 155–255, at p.207. What is actually responsible for the coincidence with railways in Kent is unclear: although railway ballast looks likely to be responsible, the species does not seem to be recorded from the main suppliers' quarries. However, this does not preclude presence at its storage locations.



Geranium purpureum **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Holborough.

Photos by Lliam Rooney, 19 June 2012

Native occurrences of subsp. *purpureum* in south west England are generally on rocky or stony places. cliffs or Cornish hedgebanks. The Kent habitats amount to an artificial proxy for such an environment and the same may be said of railway ballast generally.

Procumbent plants on coastal shingle outside Kent have been described as subsp. *forsteri*, and a plant found by Gareth Hirons in 2023 at Folkestone beach, TR 2320 3570, gave rise to conjecture as to whether that subspecies was involved. (The Folkestone record does not show clearly on the distribution map above, as very little of the tetrad constitutes land.) This subspecies has been recorded from the Channel Islands, Cornwall, Hampshire and (at least up to the 1960s) West Sussex. *G. purpureum* has continued to be recorded on West Sussex shingle to 2014, but not to subspecific level. The Folkestone site was visited by Sue Buckingham next year, locating a plant at TR 23191 35693 with the yellow undehisced anthers and small flowers of *G. purpureum* and with fruit characteristics that were difficult to interpret. Material was submitted to BSBI referee Tony O'Mahoney who considered that subsp. *forsteri* is merely a genetically modified version of subsp. *purpureum*, its few obvious characters being phenotypic responses to the harsh environment in which it grows. Confirmation would require cultivation in order to see if the prostrate habit, with a genetically determined horizontal leading shoot, is maintained. In the absence of this, we are left with the Folkestone records as being *G. purpureum* without subspecific determination, and with the likelihood that they have originated from coastal populations further west, whether by longshore drift or by seeds being transported by birds or humans due to adhesion by the mericarp fibres. Purported distinction between the subspecies based on the characters of fruit sculpturing may be of little value, given the variation which occurs through the effect of prolonged periods of cold and wet weather during fruit formation and the impact of aging, according to observations by Peter Yeo and Tony O'Mahoney.

G. purpureum may be distinguished from *G. robertianum* by having yellow anthers (Herb-Robert's are orange or purple except in white-flowered forms, but anthers need to be examined before pollen has emerged), by its generally smaller flowers (petals 5-9mm in comparison with Herb-Robert's 8-14mm) and more wrinkled fruits.

Haysden, habitat. Photo by Alan Heyes, 2 January 2021

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Greenwich peninsula (metropolitan vc16)	TQ3980		16 April 2017	WG	
Shooters Hill (metropolitan vc16)	TQ4376		9 May 2024	GH & JL	c. TQ 432 765, 2-3 plants on a wall.
Orpington	TQ4566		17 May 2018	LNHS meeting	3 plants against railings by access road to station staff car park TQ 4549 6602 plus one at crossing of alleyway and Dale Wood Road TQ 453 662
St Mary Cray	TQ4668	Railway land	(1) 7 April 2017 (2) 23 April 2015 (3) 2003 (4) 2002	(1), (2), (3) & (4) RMB	(1) St Mary Cray Station, very abundant on track by platform 3, in quantity not seen since 2002/3. (2) 100 plants at up end of station, on track by platform 3 and on or near cess of track by platform 4. (3) More plentiful on platform 3-4 tracks than in 2002. (4) About 1000 plants on railway tracks (up-direction) at west end of St Mary Cray station, one plant on platform 3, TQ 4667 6829.
Haysden	TQ5546	Railway land	27 June 2010	SB	TQ 55947 46069, plants seen in flower through fence along railway line but inaccessible.
Haysden	TQ5646		(1) 28 December 2020 (2) 25 May 2010 (3) 29 April 2009 (4) 25 May 2007	(1) AHe (2) SB (3) BW (4) SB	(1) TQ 5604 4604, growing on railway bridge and gabion flanking the structure. (2) TQ 56034 46053, 11 plants on concrete base of railway bridge.

					(3) TQ 565 460. (4) TQ 5603 4607, several plants on concrete at foot of railway bridge-support over the River Medway.
Haysden	TQ5745		13 May 2012	WFS meeting	Single plant at margin of arable field TQ 57017 45124. This site is 850m from the railway line which carried the TQ5546 and TQ5646 records.
Holborough	TQ7062		(1) 8 June 2023 (2) 13 May 2018 (3) 24 May 2016 (4) 19 June 2012	(1) DCha & ME (2) DS (3) GK (4) GK & LR	(1) TQ 705 626, over 20 plants, one by the tunnel under the railway, most plants on both sides of the footpath between small ecological park and industrial premises, mainly behind the latter's boundary fence. (2) TQ 70555 62668, at least 100 plants in this general area. (3) Still present and more abundant. (4) Scattered along footpath between stream and commercial / industrial site. From TQ 70485 62690 to TQ 70539 62670, about 70 plants. Associates were weeds of waste areas - *Hirschfeldia incana*, *Plantago lanceolata*, *Geranium pyrenaicum*, *Anisantha sterilis,* etc.
Sheerness	TQ9073		9 June 2023	GK	TQ 9067 7326 to TQ 9072 7329, edge of port car storage area adjoining concrete footpath and occasionally on footpath. Also further one along footpath at TQ 9080 7353 where growing with *Umbilicus rupestris.*
Faversham north west	TR0062		25 April 2024	DCh	TR 00510 62479, lining western link road for about 100 yards.
Faversham south west	TR0060		25 April 2024	DCh	On railway line in station, and along side of School Road next to railway at TR 00951 60962.
Faversham	TR0160		22 May 2017	LR	Seven plants on the west side of a foot bridge over the railway line at Faversham station, TR 01704 60862. [Footbridge replaced and plants not seen, May 2019, LR.]
Faversham	TR0260		27 April 2019	DCh	TR 02110 60729, several plants on steps down from footbridge over railway, 200 yards east of original site.
Ashford	TR0243		3 August 1998	MN	TR 029 432; unconfirmed.
Folkestone Harbour	TR2335		(1) 13 June 2024 (2) 19 July 2023	(1) SB (2) GHi	(1) A shingle plant at TR 23191 35693, material submitted to BSBI referee; subsp. status could not be confirmed on available evidence. (2) On Folkestone beach at TR 2329 3570. Yellow undehisced anthers and flower diameter c.7mm.
Wye	TR0446		28 May 2019	LR	TR0488 46907, a small population on the south side of the bridge over the river Stour by the Tickled Trout pub, just a stone's throw from the railway line.
Richborough / Stonar Cut	TR3361		22 May 2023	SC	30+ plants on parched verge TR 33603 61899 to TR 33539 61903.

Glaucium flavum Crantz. (Yellow Horned-poppy)

vc 15 and 16

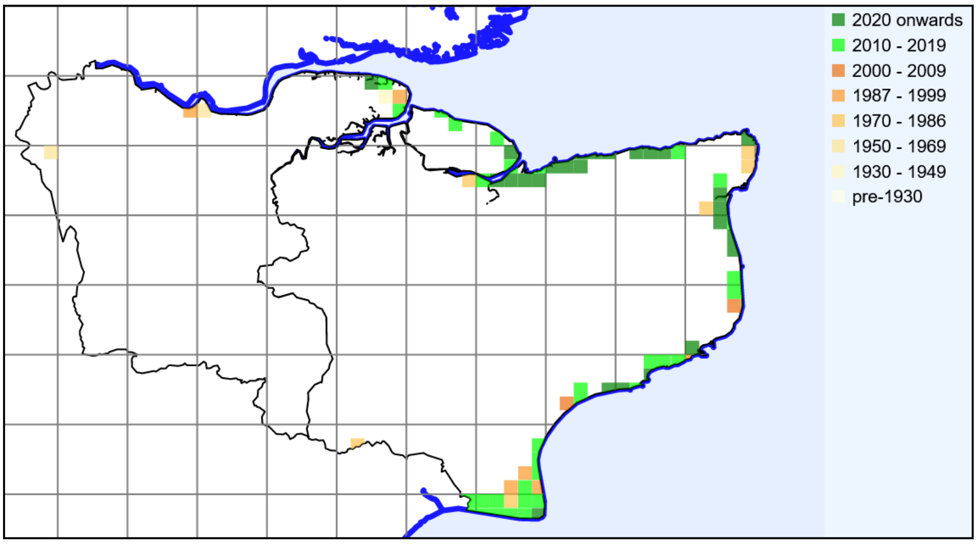
Rarity / scarcity status:

Yellow Horned-poppy grows around the coasts of the British Isles, although largely absent from north east England, from Scotland (except for the south west) and from north west Ireland. Its risk status in Great Briatin is one of 'Least Concern'; but in England there is just sufficient evidence of decline, probably as a result of coastal defence works and trampling of beaches by tourists, for the species to be treated as **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 20% in the likelihood of recording the species. In Kent, the species is neither rare nor scarce and, contrary to wider trends, showed a marginal increase of 4% in the number of tetrad records as between 1971-80 (Philp, 1982) and 1991-2005 (Philp, 2010), which has developed further since.

Oare. Photo by Lliam Rooney, 29 August 2008

Account:

The Kent presence of *Glaucium flavum* was first mentioned by William Turner in *The Names of Herbes* (1548):'Papauer corniculatum is called… in englische horned poppy or yealow poppy… It growthe in Douer clyffes, and in many other places by the sea side'. This is also the first record for the British Isles and it is still (2014) present at Dover. Such a distinctive plant is well remarked by later botanists, e.g. Thomas Johnson at Sheppey (1629) and Thanet (1632); William Pamplin at Eastwear Bay (given by Cowell in his *Floral Guide to East Kent*, 1839); T. Hunt at Herne Bay (also given by Cowell, 1839). Hanbury & Marshall (1899) considered it to be frequent in all the East Kent botanical districts which included sea-shores, where it was especially to be found on shingle. It was then also known as an introduction inland with railway ballast, but such ballast has long since ceased to be shore-derived. The only recent inland occurrence is a record at Newenden (Philp, 1982); otherwise the species appears to be almost exclusively coastal (including the inland Dungeness shingle) in Kent.

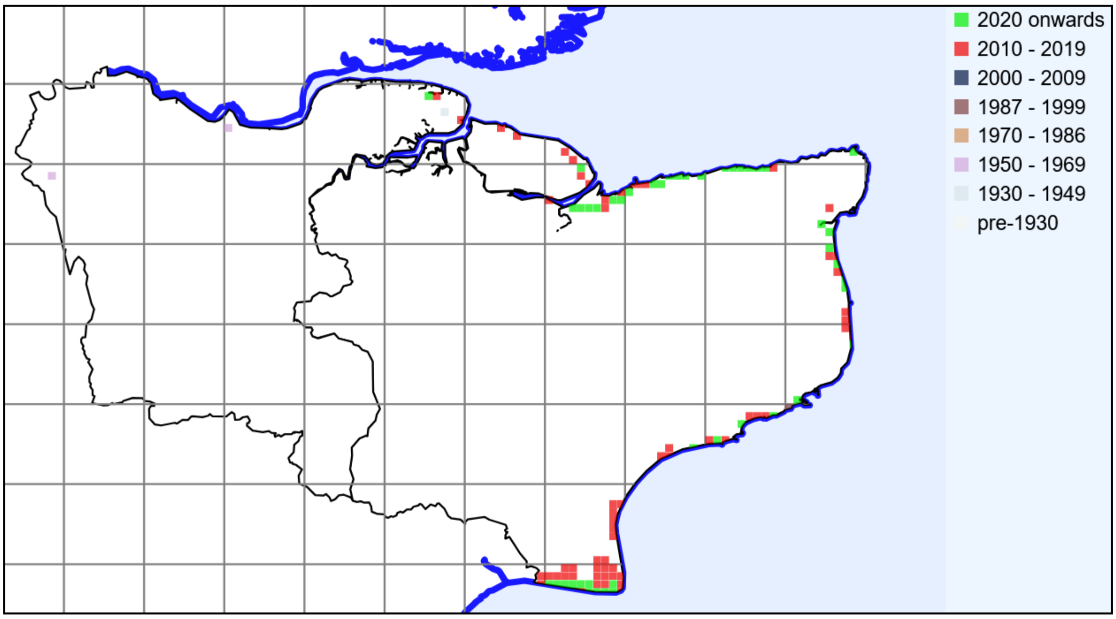


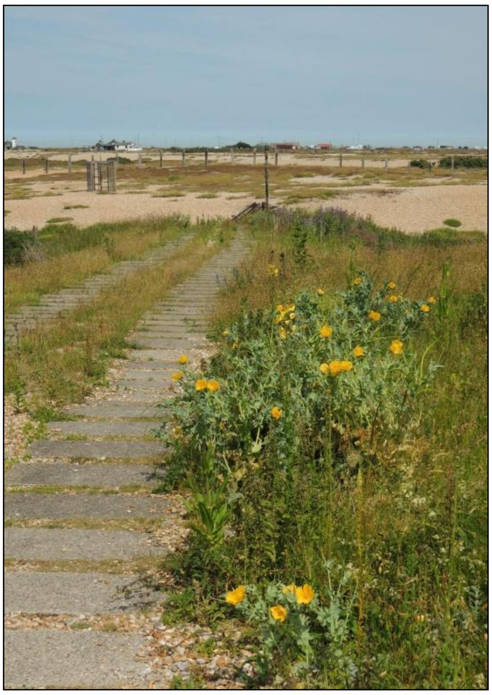
***Glaucium flavum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

For the 1971-80 survey, Philp (1982) assessed Yellow Horned-poppy as frequent on fixed shingle and occasionally sandy beaches with an East Kent distribution, other than on the Isle of Grain. The 1991-2005 survey results (Philp, 2010) were very similar, very often comprising the same tetrads, and gave the species as found on shingle banks and stony beaches, the population appearing relatively stable, with 51 tetrad records, as against 49 for the earlier survey. There is a major concentration on the Dungeness shingle in both surveys. Minor changes in the second survey included a lack of record for easternmost Thanet and an additional West Kent sighting, at Greenhithe (see distribution map above, at tetrad level).

The records for 2010-24 show a total of 61 tetrads (105 monads). This total exceeds those for the earlier surveys and includes records for tetrads not given in either of them, indicating that further spread is taking place in suitable locations. The following distribution map, at monad resolution, displays records almost entirely from this recent period, as monad-level recording became the norm in Kent from 2010.

Glaucium flavum **Kent records to 2024 mapped at monad level, from BSBI database.**





Dungeness, habitat. Photo by Lliam Rooney, 22 June 2014

Glaucium flavum is a short-lived (up to five years) perennial with a strong tap-root for penetration through shingle, but which goes hollow with age. Scott (1963[278]) has a number of observations drawn from Kent data, including the ability of the species to grow on chalk (being present on the bare, fine chalk debris of a Folkestone chalk pit approximately one mile inland in 1959, and also found in a mixture of chalk and cinders near the railway at Folkestone Warren) and its tendency on Dungeness shingle to seek the higher ground and to avoid dips which may be subject to waterlogging or flooding. Where the shingle becomes consolidated, as indicated by lichen growth, it may persist, but not establish new plants.

There is a preference for a basic substrate, which presumably includes shelly sand as well as chalk, although it has been seen at Dungeness in soil with pH as low as 5.0 as well as a site with pH values ranging from 6.1 to 6.85 and bearing an acid-tolerant flora including *Rumex acetosella* (Sheep's Sorrel) – Scott (1963) suggests that this reflects the nature of humus derived from earlier vegetation and may not reflect the acidity level prevailing when the plants became established.

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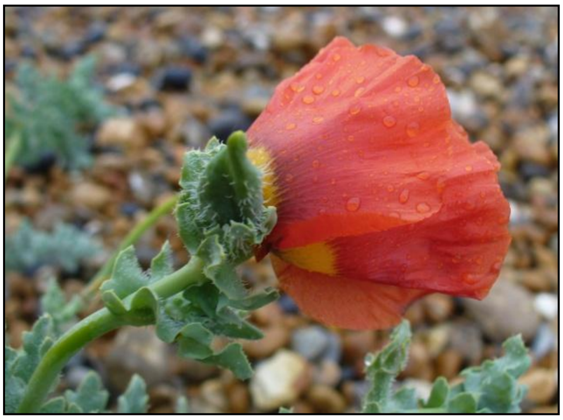
[278] G.A.M. Scott (1963). Glaucium flavum Crantz. (Biological Flora of the British Isles). *Journal of Ecology* **5**1: 743-754.

Glaucium flavum in general does not seem to be restricted to a community of particular species; rather, it is to be found in company with whatever else happens to be growing on the sandy/shingly open ground which it requires for establishment, although this results in a degree of association with shingle plants such as *Solanum dulcamara* (Bittersweet) and *Rumex crispus* (Curled Dock). The latter gives rise to the *Rumex crispus*–*Glaucium flavum* shingle community SD1), which can be the only vegetation community on shingle beaches, usually persisting as perpetually renewable pioneer vegetation. Whilst *Glaucium flavum* may grow within reach of sea spray, the leaves have a waxy coating, providing a glaucous appearance, which render them unwettable, by fresh or salt water. The species spreads by seed, which are dispersed by the pods shaking in the wind, or by sea, although the seeds do not float in calm water. At Dungeness, plants were assessed as bearing an average of just over 20 pods per season; this may translate to over 5,000 seeds per plant.



Glaucium flavum is not readily confused with any other species in the British flora, but a red flowered form has been seen at Sandwich 2011-2014, which may be distinguished from casuals of the southern European species *Glaucium corniculatum* (Red Horned-poppy) by the latter having hairy pods and stems, and flowers generally smaller.

Sandwich, red flowered form. Photo by Mel Lloyd, 5 June 2011

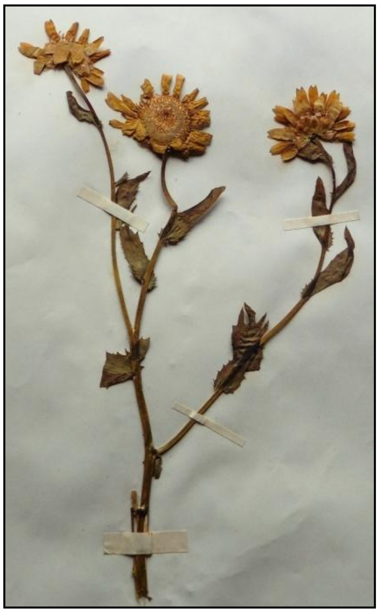
Dungeness. Photo by Lliam Rooney, 22 June 2014

Glebionis segetum (L.) Fourr. (*Chrysanthemum segetum* L. or *Xanthophthalmum segetum* (L.) Sch. Bip.) (Corn Marigold)

vc 15 and 16

Rarity / scarcity status:

Corn Marigold is an archaeophyte, or ancient introduction, found in arable fields and disturbed areas on sandy or light soils across the British Isles. It has diminished greatly in quantity since the 19th century, due to agricultural changes: improved seed cleaning, the use of herbicides, lime-spreading and a move to autumn-sown crops (Corn Marigold is mainly a spring-germinating plant). The extent of decline over Great Britain as a whole is such that the species is regarded as **Vulnerable** to the risk of extinction in the wild. This is also the risk category assigned in England, where a comparison of its area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of over 30% in the likelihood of recording the species. In Kent, it is not common, and there is a decline of 57% in tetrad records between the county surveys of 1971-80 (Philp, 1982) and 1991-2005 (Philp, 2010).



Harrietsham, from cornfield, 1843, collected by the Maidstone Natural History Society. Reproduced with kind permission of Maidstone Museum

Account:

The earliest evidence of *Glebionis segetum* in Kent appears to be its presence amongst charred cereal remains in a Roman pit dating back to 80-150 A.D. at Smeeth[279]. In terms of more conventional botanical publication, the first record belongs to Thomas Johnson in travelling between Stoke and Cliffe *(Iter Plantarum*, 1629) as well as at Thanet (*Descriptio Itineris*, 1632). Hanbury and Marshall (1899) considered the species to be common in cultivated fields and found in every botanical district. Cornfields are particularised in the *Woolwich Surveys* (1909), which covered north west Kent, and where Corn Marigold was regarded as fairly frequent.

St Nicholas at Wade. Photo by Colin Osborne, 3 May 2016

By the time of Philp (1982), however, the frequency of the plant had evidently diminished considerably and it was assessed as rather local in arable fields on sandy soil. It was also found at times on disturbed motorway verges, such as parts of the then recently constructed M20 motorway. Much of the M20 tracks the sand of the Folkestone Beds and the 1971-80 distribution largely follows a similar pattern. The 28 tetrads of the 1971-80 survey, however, had diminished to 12 tetrads by the 1991-2005 survey (Philp, 2010), when the species was considered scarce. Except for a concentration in TQ65 and 75 (west of Aylesford), there was no particular distribution pattern, other than an avoidance of Wealden clay.

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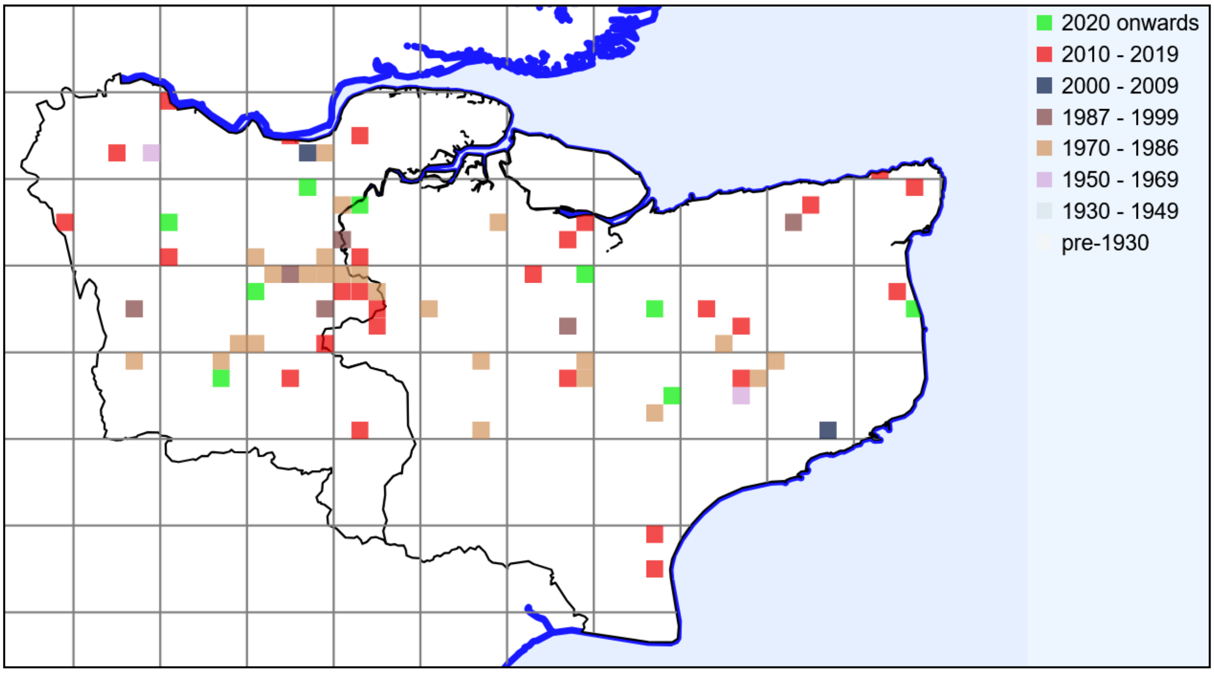
[279] C. Stevens (2006). *The charred plant remains from Bower Road, Smeeth, Kent (ARC 440/99)*. CTRL Specialist Report (Archaeology Data Service, distributor).

***Glebionis segetum* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Our 2010-24 records (36 tetrads, 36 monads) are back at, and exceeding 1971-80 levels. Tellingly, however, hardly any of these unequivocally represents survival of former cornfield populations on sandy or light soils. Indeed, the fact that the number of monad records is the same as the number of tetrads is an indication that records are widely spaced out, and the distribution map above shows a fairly random scatter which is compatible with widespread introduction.

Burham. Photo by Sue Poyser, 23 August 2015

A find at Burham in 2015 by Doug Grant and Sue Poyser growing on chalky soil disturbed by road construction in an area which has generally carried a range of arable weeds at first seemed promising; but subsequent evidence of wildflower seed mix sowing has obscured the seed-bank status of plants appearing in this area. A 2019 sighting by Richard Moyse at Jeskyns Country Park, Cobham, TQ 6638 6948, was in a recently ploughed and harrowed arable conservation plot where it not been sown, and so it may have appeared from a seed-bank, or may represent contamination of what was sown. Seed-bank status might apply to a 2016 sighting by Colin Osborne of several plants on a freshly made earth mound by a farm road at St Nicholas at Wade. However, the best status appears to be represented by two sites. One is at Uplees, where (2018) Tony Witts has noted it most years in the previous ten, in different corners of a field at Uplees in arable rotation; in 2018 it was at TQ 9984 6452, a field corner which had been ploughed, but missed by subsequent and spraying operations. The other site is at Tutt Hill, Ashford, TQ9746, where seen in 2016 (Owen Leyshon) and 2019 (Stephen Lemon) in an arable margin with a history of rare weeds.

There is a handful of metropolitan West Kent finds, of which those near Blackfen (2011) and West Wickham (2016) looked to be derivative from wildflower meadow sowing, and another (at Belvedere, 2010) was a single plant on a roadside bank in an industrial estate, albeit found there also ten years before. It has been recorded at Ditton Quarry (2010), but this site carries a number of introduced species; also at south of Barnes Street (2014), where the co-presence of *Agrostemma githago* (Corncockle) suggested sowing of wildflower seed; and on heaps of dumped soil and concrete at Sandwich Bay (2014), indicating a non-arable origin. Corn Marigold is widely available as seed, including general wildflower mixes, so all future records need to be considered with caution.

Cobham. Photo by Richard Moyse, 2019

Glebionis segetum is an annual of open disturbed ground, arable or waste, and is regarded as an indicator of calcium-deficient soils. Amongst cereals it may be injurious through the semi-succulent leaves inhibiting the drying out of the crop. Normal germination is March-May, flowering in June-August. Spread by seed is limited, subject to the action of ploughing: ray fruits may be carried a short distance by wind, disc fruits will drop from the plant. The seed bank is thought not to remain viable after 15 years.[280]

Dungeness. Photo by Owen Leyshon, 14 September 2015

It is to be distinguished from *Cota tinctoria* (Yellow Chamomile) by its coarser leaves, toothed rather than pinnate, woolly beneath (hairless in *A. tinctoria*) and clasping the stem.

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[280] Information in this paragraph is derived from S.E. Howarth & J.T. Williams (1972). Chysanthemum segetum L. (Biological Flora of the British Isles). *Journal of Ecology* **60**: 573-584.

Groenlandia densa (L.) Fourr. (Opposite-leaved Pondweed)

vc 15 and 16

Rarity / scarcity status:

Groenlandia densa is an aquatic whose status in England and in Great Britain as a whole is **Vulnerable**, at high risk of becoming extinct in the wild, due to losses from urbanisation, eutrophication and the reduction in base-rich spring-fed streams following falling water levels. In Kent, these risks are increasing: although it has been regarded as scarce, it now appears to be **rare**.

Account:

Hanbury & Marshall (1899) cite on a somewhat speculative basis Gerard's *Herball* (in the 1633 edition edited by Thomas Johnson) as potentially containing a first record for this species, in referring to it 'growing in many ponds & ditches of this kingdome both about London & elsewhere'[281]. This provides no assurance of a Kent record, however, and in the alternative they cite as a Kentish 'first' a record by W.W. Saunders in the River Dour, given by M.H. Cowell as *Potamogeton densus* in *A Floral Guide for East Ken*t (1839). The find (as distinct from its publication) may or may not have been preceded by a specimen dated August 1838 in **BM** found by Daniel Cooper (det. J.E. Dandy and G. Taylor) at Faversham, and for West Kent there is a specimen dated June 1834 in **BM** found by T.R. Tuck in Erith Marshes (also det. J.E. Dandy & G. Taylor). However, these nineteenth century records are (as Lliam Rooney has pointed out) predated by Edward Jacob's *Plantae Favershamienses* (1777) which describes a *Potamogeton*, the lesser Water Caltrops or Frog's Lettuce, as at Faversham '*In the River near the* Powder Stove – *not uncommon*'[282].

Holborough Marshes. Photo by Lliam Rooney, 26 May 2014

Hanbury & Marshall (1899) regarded the Opposite-leaved Pondweed as not uncommon in rivers, ditches and ponds, being found throughout Kent except for the North Downs between the Medway Valley and the Great Stour Valley. In Philp (1982), 25 tetrad records are given, rating the species as local, but not infrequent. There was a cluster in the Dartford area, some in the Medway gap, a few isolated records elsewhere, but the main concentration was in north east Kent – the Stour Valley, including the Little Stour, and the Worth-Hacklinge area. This last area has been particularly rich, as was shown by surveys of Hacklinge ditches in 1982 and 2003. Philp (2010), however, shows only a skeletal distribution in comparison with the 1982 publication, stating that the decline in abundance across the county has mainly been due to habitat loss.

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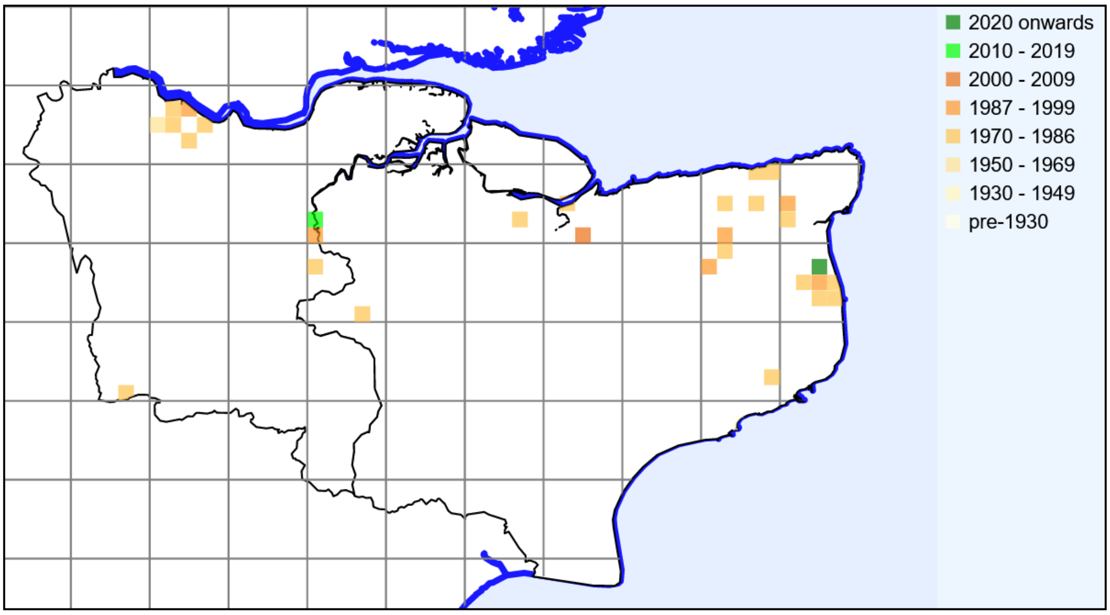
[281] At p823, not p283 as given by Hanbury & Marshall (1899).

[282] These English names are assigned by various authors to *Groenlandia* (then *Potamogeton densum*). Jacob also referred this plant to Latin names used by John Ray and William Hudson. Ray's naming on good authority applies to *Groenlandia*. Hudson's naming is more ambiguous and leads both to *Groenlandia* and to a form *serratum* of *Potamogeton crispus*. As all but one of the names cited by Jacob point directly to *Groenlandia*, and that one could do so, but is ambiguous, it seems reasonable to conclude that he indeed intended *Groenlandia*, which has later records from his area, and so might be expected to have been found.

Given that there were records during the period 1991-2005 which were not seen by Eric Philp personally and so are not reflected in Philp (2010), the losses may not then have been as extensive as envisaged. However, only one such East Kent record has been made for the period 2010-24 – the position needs to be tested further by targeting previous sites, particularly in the Little Stour catchment and Worth/Hacklinge area. The one record which has been made is an intriguing one, north east of Worth, in 2018 by Danny Chesterman. It relates to a pond which had only recently been dug in fixed dunes, probably to provide golf club water storage, and the *Groenlandia*'s arrival must presumably be attributable to wildfowl or golf club tools or equipment. The apparently catastrophic decline of this species recently in Kent is evident from the distribution map below.

Groenlandia densa **Kent records to 2024 mapped at tetrad level, from BSBI database.**



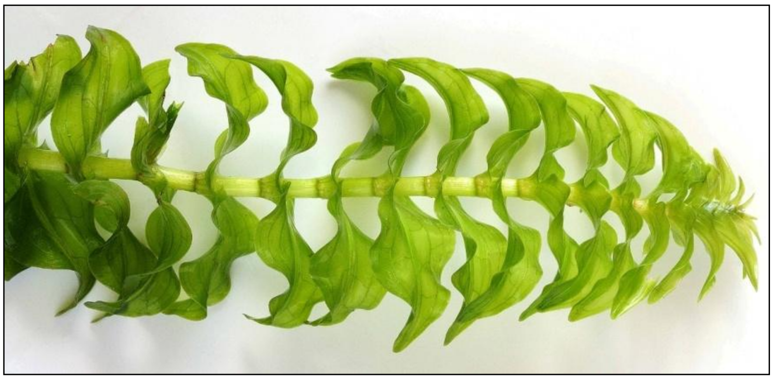
The plant's preference for base-rich waters not subject to eutrophication accounts for it being found where there is run-off from the chalk, as at Snodland/Holborough and in north east Kent, where chalk contributes to the waters of the Stour and to drainage around Thanet, where it is the underlying formation, and to the Worth/Hacklinge area, where calcareous water over peat has give rise to fen conditions in places. Other geological formations may supply bases; and presumably ragstone within the Hythe Formation provided suitable conditions for the occurrence of Opposite-leaved pondweed at Loose.

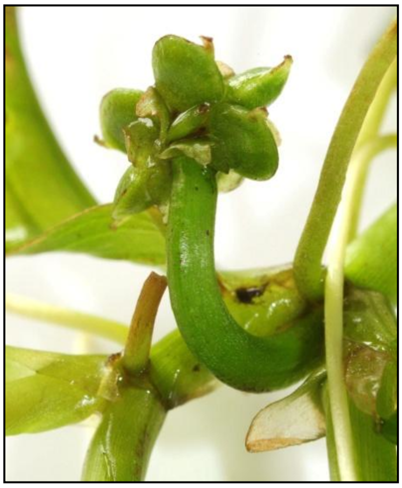
Holborough Marshes, habitat. Photo by Geoffrey Kitchener, 26 May 2014

Groenlandia densa is readily distinguished from most other aquatics by its opposite leaves. The only other confusable waterweed with opposite leaves is *Zannichellia palustris* (Horned Pondweed) and these species may be keyed apart as follows:

Leaves lanceolate to ovate, 1.5-13mm wide, 2-9x as long as wide, flowers bisexual. **Groenlandia densa.**

Leaves linear, ≤2mm wide, >10x as long as wide; flowers unisexual**.** Cross section of leaves with two large hollows. **Zannichellia palustris.**





From Holborough Marshes. Photos by Lliam Rooney, 8 June 2014

Site	Grid reference	Site status	Last record date	Recorder	Comments
River Cray: Barnes Cray - Crayford	TQ5275		23 August 1983	JRP	[R. Cray in TQ5174 searched in 2013 for a 1964 records, but not found, GK. Observations in 2009 indicate that the river was then heavily polluted.]
Dartford Marshes	TQ5477		(1) 12 August 1985 (2) 1973	(1) JP (2) JRP	(2) Grid reference given as TQ57N. There is a 1962 FR record for 'the far ditch' at TQ 543 772.
Stone Marshes	TQ57		5 July 1975	JRP	Presumably TQ57S, now Crossways Business Park.
East Wilmington	TQ57L		After 1970, before 1983	JRP & EGP (Philp, 1982)	
Loose	TQ75Q		19 October 1976	EGP	Small stream-fed lake.
Snodland	TQ76A		(1) 10 August 1982 (2) 7 June 1991 (3) 1987	(1) CSu (2) JP (3) EGP & JBe	(1) TQ 7070 6098, Snodland mill stream. (2) TQ 705 604.
Holborough	TQ76B	KWT managed reserve	(1) 14 July 2018 (2) 26 May 2014 (3) 2001 (4) After 1990, before 2006 (5) 1998 (6) 23 July 1995	(1) DCh (2) SL & GK (3) DP (4) EGP (Philp, 2010) (5) ESL (6) JP	(1) TQ 70720 62712, small plant just regrowing where ditch had been cleared, known site. (2) TQ 70700 62695, a couple of plants in clear water of ditch on marshes with slight flow from piped section. (3) TQ 7094 6265 &/or TQ 727 626, TQ 728 626. (4) Probably TQ7062. (5) TQ 7104 6293. This reference appears to be a little too far east. (6) Holborough mill stream, TQ 7073 6265. [Not found 2014, GK.]
South of Graveney	TR06K		26 May 2005	EGP & DG	
Littlebourne	TR2157		15 October 1991	CD	TR 2102 5725. [TR 2147 5707 also given in source data, but this seems unlikely.] May be same location as TQ25D in Philp, 2010.
Seaton, Wickhambreaux	TR2258		October 1991	CD	TR 2256 5870, Little Stour river corridor survey.
Wenderton, Wickhambreaux	TR2359		21 October 1991	CD	TR 2333 5938, Little Stour river corridor survey.
Preston Marshes	TR2360	SSSI	7 June 1983	RK & GP	c. TR 231 602.
Preston Marshes	TR2461		1998	JP	TR 240 610.
Grove	TR2361		4 May 1996	NS	West side of flood plain, south east of Parsonage Farm.

Preston, Wickhambreaux	TR2359		11 July 1991	CSu	TR 2348 5984, Blackhole Dyke, Little Stour valley.
Monkton Marshes	TR26S		18 July 1973	EGP	In marsh dykes.
Great Brooksend Farm	TR2868			AJ & JM	TR 286 686.
Lower Goldstone	TR2960		(1) 29 July 1993 (2) 19 August 1992	(1) & (2) CSu	(1) TR 2981 6095, River Snipe. (2) TR 299 608, River Snipe.
Minster	TR36C		After 1990, before 2006	EGP (Philp, 2010)	
West of Hacklinge	TR3354	SSSI	1982	AH	TR 33332 54449, TR 33462 54599, TR 33637 54494.
North east of Northbourne	TR3453	SSSI	1982	AH	TR 34331 53616.
Hacklinge	TR3454	SSSI	(1) 2003 (2) 2 April 1993 (3) 1982	(1) CEC (1) NS & RS (2) AH	(1) TR 34052 54450. (1) TR 348 549. (2) TR 34320 54050, TR 34876 54909, TR 34052 54450. TR 34340 54190, TR 34590 54150, TR 34473 54202, TR 34742 54425, TR 34854 54896. Also, a TQ35M record from Philp (2010) may belong here.
Worth Minnis	TR3455	SSSI	1982	AH	TR 35000 55710, TR35170 55710.
Worth Temptye	TR3456	SSSI	1982	AH	TR 34424 56571, TR 34710 56100, TR 34532 56302.
East of Sandwich	TR3458	SSSI	2003	CEC	TR 34914 58657.
Sandwich	TR3459		2 March 1983	AH	TR 348 595, described as North Stream, so TR 348 585 may have been intended.
South of Betteshanger (formerly Fowlmead) C.P.	TR3553	SSSI	1982	AH	Near Cottington Court Farm, TR 35730 53230.
Roaring Gutter	TR3555	SSSI	2 April 1993	NS & RS	TR 351 555, second to west of four parallel ditches.
Sandwich Bay	TR3557	SSSI	8 September 2018	DCh	TR 35632 57904, plentiful in newly dug flooded pit in dunes, probably excavated to provide water storage for golf club. Water appears clear, and there were several patches. *Zannichellia palustris* also present.
Old Downs Farm, Worth - Sandwich	TR35N		22 June 2002	EGP	

Gymnadenia densiflora (Wahlenb.) A. Dietr. (Marsh Fragrant-orchid)

Current occurrence in vc 15 and 16 requires confirmation

Rarity / scarcity status:

Gymandenia densiflora has not been assigned a threat status in Britain for conservation purposes, as not enough is known about it to do so. As a taxon, it has been carved out of *Gymnadenia conopsea* (Fragrant Orchid), which was long recorded as a single species in Britain. The standard Floras often mentioned a variety, *densiflora*, but it was not until 1991 that it was generally recognised that the Fragrant Orchid should be regarded as covering three taxa, after then treated as subspecies: *borealis*, *conopsea* and *densiflora*. This was a division promoted by Francis Rose, who considered that they might well merit specific rank, eventually. The adoption of specific status in the 3rd edition of Stace's *New Flora of the British Isles* (2010) and its continuation in the 4th edition (2019) has meant that Marsh Fragrant-orchid cannot any longer be swept under the carpet in recording Fragrant Orchid; but it does not follow that we currently have clear data about its occurrence, whether in Kent or Britain as a whole. This taxon was included in the rare plant register as a consequence of a passing mention in Philp (2010) and on the basis of comments by Francis Rose to Geoffrey Kitchener as regards *Gymandenia densiflora* occurring in Kent. It has, however, not yet been possible to verify its current status, and whether it is indeed at present a Kent species. This account must be regarded as an interim note and continued investigation would be desirable.

Account:

No localised published records for Kent have yet been traced, but it is possible to make some inferences from citations of Fragrant Orchid occurrences. Christopher Merrett in his *Pinax Rerum Naturalium Britannicarum* (1666) refers to '*Orchis* Caryophillata spica longissima rubra, In many Chalkey grounds, bogs and old pastures betwixt *North-fleet* and *Thames* in Kent'. *Gymnadenia conopsea* (in the strict sense, Chalk Fragrant-orchid) would account for the bulk of records for the chalky grounds and old pastures, but not those for bogs. Any marshy ground between Northfleet and the estuary would at this point have been highly calcareous, as the chalk approaches close to the river, although much quarried away since the seventeenth century. The three Fragrant Orchid taxa have differing habitat preferences. *G. conopsea* (in the strict sense) is a plant of dry chalk or limestone grassland. *G. densiflora* grows in base-rich fens and has also been claimed for north-facing chalk grassland, with a fairly wide scatter of records in Sussex[283]. *G. borealis* is generally a northern plant of acid hilly grassland, but can occur in base-rich grassland, and atypical occurrences are known in Hampshire and East Sussex, that is, on base-rich clays in the New Forest; in *Molinia caerulea* (Purple Moor-grass) flushes on heathy soils in the Ashdown Forest; and on the north-facing Alfriston Downs[284]. Accordingly, Merrett's reference to plants in bogs between Northfleet and the Thames is most likely to have been to *G. densiflora* (*G. borealis* seems comparatively improbable).

G.E. Smith, in his manuscript notes (1830-33) to *A Catalogue of rare or remarkable phaenogamous plants collected in South Kent* (1829) refers to *Orchis conopsea* and that 'The flowers, when in bog-land acquire the hyacinthine scent; as on the Aldington bog' (south east of Ashford). This could well have been *G. borealis*. Hanbury & Marshall (1899) cite a couple of other occurrences which may be unusual in terms of habitat. They mention a specimen at North Cray Brooks which, if from damp ground, may be suggestive of *G. densiflora;* and a specimen in Dillenius' herbarium from Chislehurst which is less likely to carry normal *G. densiflor*a habitat, although the acid terrain may instead suggest *G. borealis.* However, Marshall himself was acquainted with *G.*

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[283] *G. densiflora* on the Sussex Downs may have a degree of distinctiveness suggestive of subsp. *friesica* – Bateman, R. & Denholm, I. (2019), Mapping the near-cryptic fragrant orchids of Britain and Ireland, *BSBI News* **40**: 6-12.

[284] The presence of downland *G. borealis* in East Sussex, however, does not appear to be supported by genetic testing: Campbell, V.V. et al. (2007). Genetic differentiation amongst fragrant orchids (*Gymnadenia conopsea s.l.)* in the British Isles. *Botanical Journal of the Linnean Society* **155**: 349-360.

densiflora, since there is a specimen of his in **CGE** from West Kent (TQ56) gathered on 9 July 1898. It is not mentioned in the 1899 Flora, for Marshall regarded as it as being no more than a variety, in a district where Fragrant Orchid was common. There is also an East Kent (TR23) specimen in **CGE**, collected by the theologian, the Rev. Frederick Tennant, in June 1890. In **MNE**, there is material gathered by Davis in 1916 from Keston Common and labelled as var. *densiflora*; although the habitat suggests *G. borealis*, the specimens resemble more *G. densiflora*. The record of *Orchis conopsea* by Miss Sankey in Cowell's *Floral Guide to East Kent* (1839) at Little Britain, Wingham may also have been *G. densiflora*, given the presence of calcareous fen, and its apparent accompaniment by *Epipactis palustris* (Marsh Helleborine). At Ham Fen, it is supposed to have been seen c. 1920, but conditions at its location completely changed afterwards, according to Francis Rose's manuscript *Flora of Kent*.

G. densiflora was listed for the rare plant register as an expected current plant, particularly having regard to Francis Rose's assertion that he had found it in considerable quantity in East Kent, although his manuscript *Flora of Kent*, drafted earlier, treated it as probably extinct. It appears that a site which he had in mind was at Park Gate, and this was investigated by Alfred Gay in 2013, consulting with Richard Bateman. He found many robust plants with characters consistent with *G. densiflora,* such as the number of flowers on the inflorescence (often 80 to 100), the shape of the labellum (noticeably wider than long, with large lateral lobes), the long inrolled lateral sepals, and presence of several bracteoidal leaves. However, there were inconsistent characters as well: the flowers of *G. densiflora* might have been expected to have been darker with paler centres and with shorter spurs (according to Richard Bateman), and the flowering period of *G. densiflora* is often regarded as being later than the early to mid-June peak exhibited by this colony in 2013 (coincident with the flowering of neighbouring *G. conopsea*[285]). In terms of habitat, the location did not correspond to the north-facing downland of Sussex, which Francis Rose regarded as a habitat for *G. densiflora* 'in many ways 'a different world' ecologically'[286] from chalk downland receiving direct sunlight. The Park Gate colony grows on warm, thin, dry soils in a south-facing chalk pit. The flower odour was perceived as being sweet and faintly sickly, although Francis Rose apparently considered that the odour for this colony was that characteristic of *G. densiflora* (spicy to carnation-like).

It appears that this colony is, overall, not a clear candidate to be *G. densiflora.* Richard Bateman also referred to similar plants at Crundale Down which could not be clearly assigned to *G. densiflora* on morphological grounds. Alfred Gay's observations in 2013 show that other similar robust, many flowered, broad-lipped plants are present at several other Kent sites (including at Lydden NNR, Elmsted and Cheriton Hill at Folkestone) all growing amongst normal *G. conopsea* and in its typical habitat. The Park Gate population was also assessed by David Johnson on 5 June 2014, when the plants were in full flower. On the basis of this early flowering and the flower colour being not as deep nor the lip as broad as might be expected, he also was not satisfied that the population was *G. densiflora*, although plants were somewhat different in stature and colour intensity from *G. conopsea* elsewhere in the reserve.

Potentially better candidates for *G. densiflora* were encountered by Alfred Gay on the eastern arm of the Kneading Trough at Wye which appeared to have a more pleasant (less sickly, albeit not noted as clove-like) fragrance and which were in flower quite late in the season (July 10th 2013). Aside from the flowering time and fragrance, the flowers were also a deeper pink than usual but with a paler centre, providing a better match for *G. densiflora.* The inflorescences did not have quite as many flowers as the Park Gate plants (60-70 at most), but the labella on some were just as wide (7mm) and curiously were often slightly turned up at the edges. They were also growing within a much larger population of normal *G. conopsea* which had almost entirely gone over, so that there would be a genetic isolating effect of flowering times; but there is a question as regards whether some gene-flow is accountable for plants which do not accord fully with the characters to be expected of *G. densiflora.*

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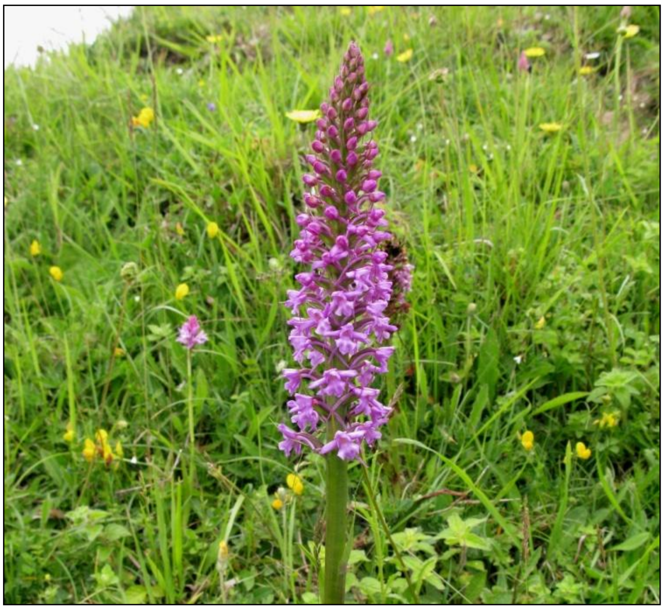
[285] The coincidence of flowering is not necessarily material, as overlap might be expected, but the later flowering of *G. densiflora* is something which appears to have been widely observed, including in the south eastern Europe, where *G. densiflora* does not start before 10 June – K. Marhold et al. (2005) Morphological and karyological differentiation of *Gymnadenia densiflora* and *G. conopsea* in the Czech Republic and Slovakia. *Preslia* **77**: 159-176. However, C. Stark et al. (2011), cited below, mention Continental studies indicating that flowering depends on ploidy level (*C. conopsea* s.s. is diploid or tetraploid; *G. densiflora* is diploid) and does not provide a clear distinction.

[286] Francis Rose (1995). *The Habitats and Vegetation of Sussex.*

Future investigations in Kent may perhaps be best directed, not just to this last population, but to any locations away from chalk, especially if damp. Philp (2010) refers to *G. densiflora* (regarded as a subspecies) being noted on occasion, but without detail as to the sites. However, the TR05Y record in that publication is for a tetrad which contains very little chalk and may contain one of those sites. Philp (1982) also includes records for tetrads off the chalk, e.g. from Sandwich Bay TR36K (there is calcareous ground here, but generally damp), the Isle of Sheppey TQ97W (London Clay/Bagshot Sands), near Westerham TQ45G (Lower Greensand) and near Halls Green TQ54J (Wealden Clay). One cannot rule out *G. densiflora* on the chalk, however, as it has been pointed out that British *G. densiflora* includes a taxon which flowers at approximately the same time as normal plants but which can tolerate drier habitats.[287] The position is complicated by the traditional means of separating the different *Gymnadenia* species having been called in question, the most reliable factors being habitat and the number of bracteoidal leaves (i.e. those below the inflorescence and not fully encircling the stem at their base): 4 or 5 for the majority of *G. densiflora* plants; 2 or 3 for most *G. conopsea* and *G. borealis*.

Whilst DNA analysis should be capable of determining the position regarding the Park Gate and Wye colonies[288], the characters and behaviour of the plants here as yet are insufficiently clear cut for a conclusive understanding as to whether *G. densiflora* is to be treated as a taxon currently present in Kent. This conclusion is shared by David Johnson in his *Wild Orchids of Kent* (2019).

This account has benefited greatly from the assistance of Alfred Gay.



The Park Gate *Gymnadenia*. Photo by Sue Buckingham, 17 June 2012

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[287] Bateman, R. & Denholm, I. (2019, cited earlier.

[288] They are well differentiated in Germany by DNA sampling, according to C. Stark et al. (2011), Strong genetic differentiation between *Gymnadenia conopsea* and *G. densiflora* despite morphological similarity. *Plant Systematics and Evol*ution **293**: 213- 226. In that study, only 77% of *G. densiflora* material could be assigned to its correct identity on morphological characters alone

Kent Rare Plant Register
Species accounts Part H

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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The register formerly included the following species accounts which may now be found at **Appendix A** of the register, https://bsbi.org/kent:

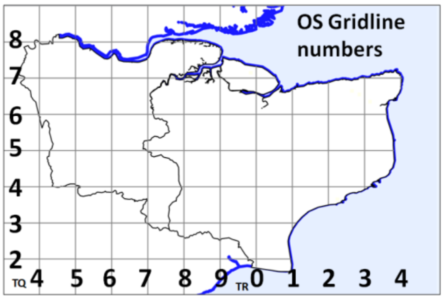
Helleborus foetidus (Stinking Hellebore)
Hippuris vulgaris (Mare's-tail))

Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AB Alan Blackman
AG Alfred Gay
AH Tony Harwood
AL Alex Lockton
AW Tony Witts
BB Brian Banks
BBu Bryan Bullen
BL Brian Laney
CAS Clive Stace
CB Charles Boxer
CN Clive Nuttman
CO Colin Osborne
CW Caroline Ware
DC David Chambers
DCh Danny Chesterman
DCo Daniel Colborne
DG Doug Grant
DH Damian Hone
DJ David Johnson
DK Fr Dunstan Keauffling
DM Daphne Mills
DML Duncan McLean
DS David Steere
DW David Watson
EGP Eric Philp
ES Ewan Shilland
EW Elizabeth Winterbourne
FB Fred Booth
FJR Fred Rumsey
FOH Fred O'Hare
FR Francis Rose
GH Graham Harlow
GK Geoffrey Kitchener
GT Gill Tysoe
HE Hubert Elgar
HW Hector Wilks
IJ Ian Johnson
IS Ian Sapsford
JA Jan Armishaw
JB John Badmin
JBM John Braybrooke Marshall
JD John Dicker
JE J. Edwards
JM Joumana Mobarak
JP Joyce Pitt
JPu John Puckett
JR John Roberts
JRP John Palmer
JS Judith Shorter
JSw John Swindells
JVVD John Van De Dol
JW Jo Weightman
KBRG Kent Botanical Recording Group
KFC Kent Field Club
LM Lesley Mason
LR Lliam Rooney
LS Lindsay Stronge
MA Martin Allison
ME Michael Easterbrook
MK M. Knapp
ML Mel LLoyd
MN Martin Newcombe
MP Mike Phillips
MT Mick Tilley
NM Nigel Morley
NS Nick Stewart
NT Neil Tew
OFC Orpington Field Club
O Owen Leyshon
P&PH Pauline & Peter Heathcote
PG Peter Gay
PH Peter Heathcote
PHa Peter Hall
PB P. Buckley
PBa Pauline Bateson
PG Phil Green
PGl P. Glading
R&PB Richard & Peter Black
RD R. Dix
RE Ruth Eastwood
RM Richard Moyse
RMB Rodney Burton
RoF Lady Rosemary FitzGerald
RR Rosemary Roberts
SB Sue Buckingham
SC Steve Coates
SD Selwyn Dennis
SK Sarah Kitchener
SLo Steven Lofting
SP Sue Poyser
SW Stefan Walton
TI Tim Inskipp
VAJ V.A. Johnstone
WR Bill Ridley

BM = Natural History Museum herbarium	Hanbury & Marshall (1899) refers to their *Flora of Kent*	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G.Philp
BSBI = Botanical Society of Britain & Ireland	KWT = Kent Wildlife Trust MNE = Maidstone Museum herbarium	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G.Philp

Helianthemum nummularium (L.) Mill. (Common Rock-rose)

vc 15 and 16

Rarity / scarcity status

Helianthemum nummularium is widely distributed over the British Isles, the spread being somewhat patchy in view of its predilection for calcareous soils, although in Scotland it extends onto mildly acid ground. In Great Britain as a whole, its conservation status is one of 'Least Concern'. In England, however, there is some evidence of decline, and it is treated as **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 22% in the likelihood of recording the species. There have been losses since the 1950s through the conversion of chalk grassland to arable and its reversion to scrub. In Kent it is not uncommon, but there has been a decline of 24% in the number of tetrad records between the county surveys of 1971-80 (Philp, 1982) and 1991-2005 (Philp, 2010). It is a Kent axiophyte and so is indicative of good habitat.

Wye Crown habitat. Photo by Lliam Rooney, 14 June 2012

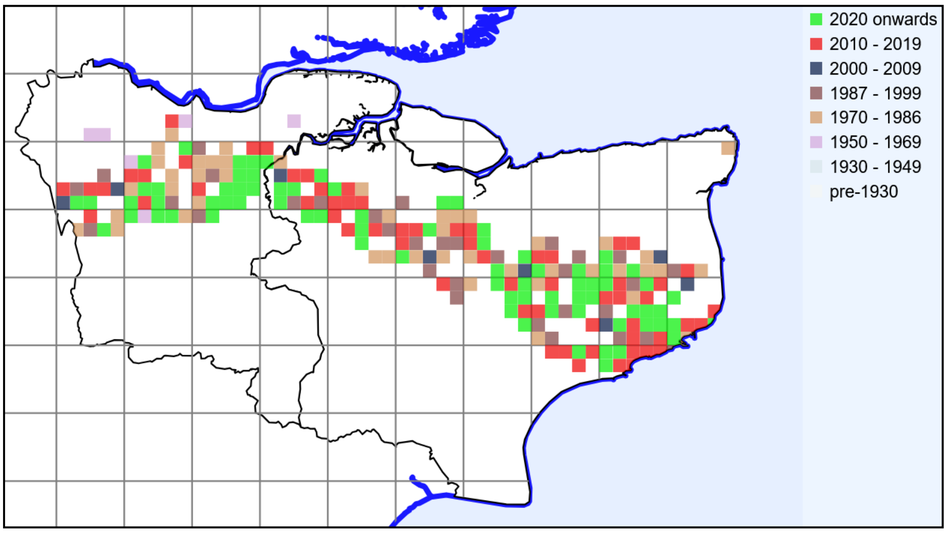
Account

The first published Kent record for Common rock-rose is by John Gerard in his *Herball* (1597), in which he states that 'I have found them in verie many places, especially in Kent, upon the chalkie banks about Gravesende, Southfleete, and for the most part all the way from thence unto Canterburie and Dover'. Although Gerard's originality has been questioned generally, this comment suggests a degree of familiarity with the Watling Street route between London and Dover. Some of this route was replicated by Thomas Johnson, who saw the species in travelling between Gravesend and Rochester in both 1629 and 1632 (*Iter Plantarum* 1629 and *Descriptio Itineris* 1632). Any early botanist encountering chalk terrain in Kent is likely to have come across this plant, just as Edward Jacob described it in the Faversham area, '*on dry chalky Banks – very common*' (*Plantae Favershamienses*, 1777). Hanbury & Marshall (1899) treated *Helianthemum nummularium* as very common on downs, banks, etc. on the chalk and had record of it in all botanical districts except for metropolitan West Kent, where the authors nonetheless felt that it surely occurred. In that, they were right, as the *Woolwich Surveys* (1909) confirmed it as plentiful on chalk banks in portions of West Wickham, Hayes and Keston parishes. This is only an occasional geology for the south of those parishes, and Francis Rose referred to the ability of the species to grow, not only on chalk, but on sunny south-facing banks of calcareous Thanet Sand, which lies directly over the chalk.

By the time of the 1971-80 county survey (Philp, 1982), the species remained common in suitable habitats and was found in 176 tetrads on downland, open scrub and roadside banks on the chalk. The 1991-2005 survey (Philp, 2010), however, gave only 134 tetrads. New locations had been found (for example, on the Hoo peninsula), but on the whole there was a retrenchment of outlying records (so that it was no longer recorded on the chalk at Thanet) and a general thinning-out, noticeable in West Kent. No reason was suggested, but one is bound to consider whether this is a product of habitat changes.

Queendown Warren. Photo by Lliam Rooney, 18 June 2010

Historically, there have been considerable losses of chalk grassland in the county through agricultural changes and scrubbing over, but in more recent times (2003-12) there appear to have been gains rather than losses[289]. The position is not straightforward because of different definitions applicable to the broad type of habitat, but the most useful definition appears to be that governing the BAP priority habitat, lowland calcareous grassland (now a habitat of principal importance for conserving or enhancing biodiversity under s.41 Natural Environment and Rural Communities Act 2006). This is because *Helianthemum nummularium* is regarded as one of several indicator species, of which a number have to be frequently or occasionally present before a habitat may be classified as this type. It is questionable, however, how readily *Helianthemum nummularium* may be capable of returning to land which, through restoration work, is otherwise treated as a gain to the county's chalk grassland total.



***Helianthemum nummularium* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The 2010-24 data confirm the earlier distribution pattern, with the species following chalk strata across the county, and with coverage of 137 tetrads (202 monads), a decline from the 176 tetrads of the 1971-80 survey and also (just) from the 134 tetrads of the 1991-2005 survey if adjusted to take account that the 137 tetrads include six attributable to metropolitan West Kent, which Philp (2010) did not cover. But our 2010-24 data show some thinness of cover between Wye and Harrietsham, which may respond to further survey; the losses since the 1970s in the Longfield/Meopham/Hartley area look less likely to do so.

The detail of current records, albeit with the loss of comparison with historic losses, is shown more fully at monad resolution in the following distribution map (records before 2010 were seldom made at finer resolution than tetrad level).

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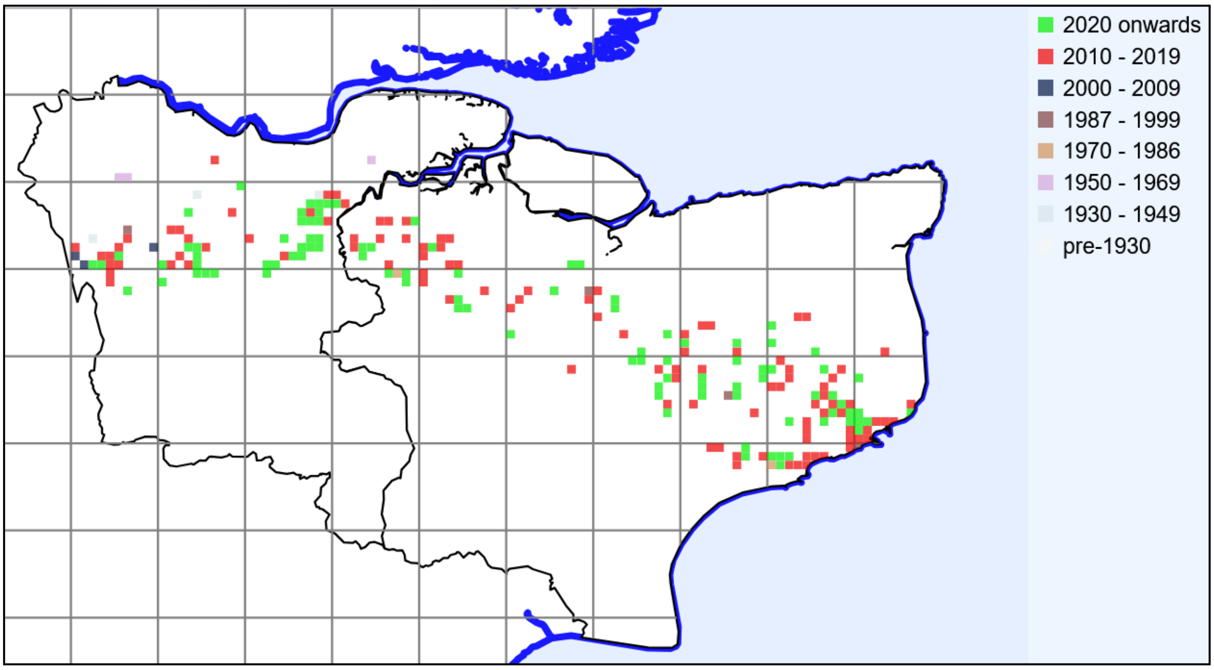
[289] *Change Analysis of UKBAP priority habitats 2003-2012.* http://www.archnature.eu/assets/files/Activity%201/ChangeAnalysisUKBAP_habitats2003_2012.pdf

Helianthemum nummularium **Kent records to 2024 mapped at monad level, from BSBI database.**



Ranscombe. Photo by Sue Buckingham, May 2012

Common Rock-rose is an evergreen perennial shrub with woody or wiry stems, low-growing and fairly compact in open conditions, somewhat straggly when vegetation is taller. It may be found in Kent particularly on open very steep ground towards the top of chalk slopes, where the thinner soils may have an effect on competition. Its survival strategy is one of stress toleration[290]. In coarser vegetation it may spread by layering, but ultimately is unlikely to thrive; it does not grow in strong shade.

Optimal growth appears to be achieved under grazing regimes, reflecting its association with ancient chalk grassland. Not only does grazing keep competing vegetation under control, but it also provides open conditions for seedling establishment. Germination of Common rock-rose seed is significantly more successful than with most other tested species when the seed is consumed and excreted by herbivores[291]. However, seed otherwise seems to be poorly dispersed, which may limit Common Rock-rose to old habitats.

The species is well-represented on Kent nature reserves, pointing to the importance of chalk grassland in Kent (comprising a significant proportion of the UK total lowland calcareous grassland) and to the representation of Common Rock-rose in the most species-rich of these locations.

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[290] Grime J.P., Hodgson, J.G. & Hunt, R. (1988). *Comparative Plant Ecology*.

[291] E.Cosyns, A. Delporte, L. Lens & M. Hoffmann (2005). Germination success of temperate grassland species after passage through ungulate and rabbit guts. *Journal of Ecology* **93**: 353-361.

The Old Chalk, New Downs project of 2018-22[292] for improving management of chalk grassland between Kemsing and Detling undertook 'before-and-after' condition assessments from which Common Rockrose was found to be negatively associated with *Centaurea scabiosa* (Greater Knapweed) (reflecting the latter's preference for more nutrient-rich terrain and tolerance of higher swards), but positively associated with *Viola hirta* (Hairy Violet), *Thymus* spp. (Thyme), *Poterium sanguisorba* (Salad Burnet), *Polygala vulgaris* (Common Milkwort), and *Carex flacca* (Glaucous Sedge), species generally preferring a short sward.

Helianthemum nummularium is easily recognised, especially when in flower, and is not readily confused with any other species to be found in Kent.

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[292] Price, J., Wayman Rook, L. & Thornley, R. (2023). Chalk Grassland Condition Assessment: Findings from the North Downs. *Transactions of the Kent Field Club* **22**: 21-34.

Helosciadium inundatum (L.) W.D.J. Koch (*Apium inundatum* (L.) Rchb. f.) (Lesser Marshwort)

vc 15; may be gone from vc 16

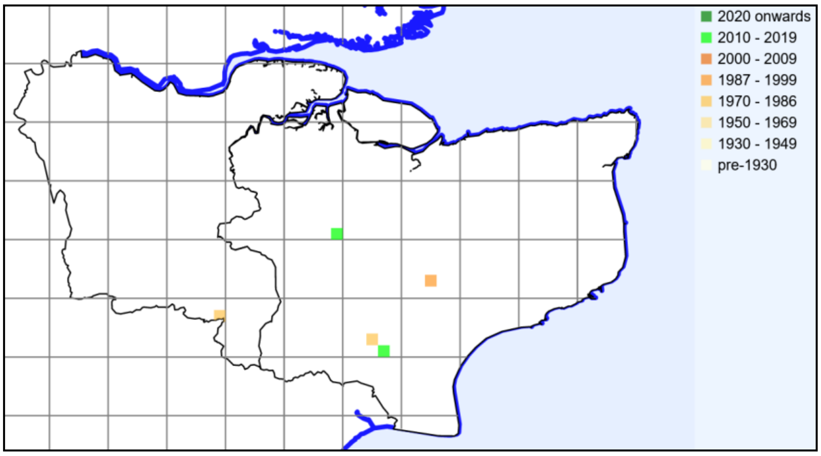
Rarity / scarcity status:

Scattered over most of the British Isles where there are shallow waterbodies, *Helosciadium inundatum* gives rise to no general conservation issues for Great Britain as a whole (where its risk is treated as of "Least Concern"). The rate of decline in England, however, means that it is regarded as **Vulnerable** here; and In Kent it is **rare**. It is a Kent axiophyte and so is indicative of good habitat.

Lenham. Photos by Lliam Rooney, 24 May 2015

Account:

In 1777, Edward Jacob described *Helosciadium inundatum* as not common in the dykes of Nagden Marsh. Nor does it ever seem to have been particularly common on a wider county basis, Hanbury & Marshall (1899) describing it as well distributed, but rather rare. Francis Rose considered it rare, much more so (in the 1940s and 50s) than formerly. He noted it at Chislehurst Common (1946), Hale Street (1954), Godmersham (1944), Hinxhill (1956), Lamberhurst (1938-56) and New Romney Warren (1950). Philp (2010) recorded it from only two tetrads, but different ones from the three tetrads given in Philp (1982), emphasizing the scattered nature of its county distribution. Since 2010, it has only been recorded in one of the Philp (2010) tetrads and one of the Philp (1982) tetrads.



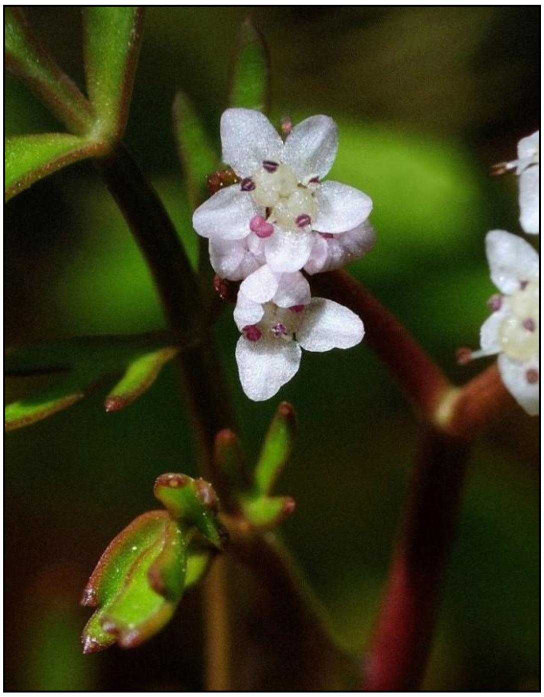
Helosciadium inundatum **Kent records to 2024 mapped at tetrad level, from BSBI database.**

It is a small plant which grows in shallow water, including muddy edges subject to drying out. It is at risk over the decline of such habitats or their eutrophication. The introduced *Crassula helmsii* (New Zealand Pigmyweed) would appear capable of occupying intensively the same type of habitat, as has happened at a pond at Hinxhill, where *Helosciadium inundatum* has not been re-found recently. The surviving site at Lenham is owned by Heaths Countryside Corridor and is maintained so as to control vegetation encroachment. The other surviving site, two stations at Appledore, is a ditch (the Government Drain) running parallel to the Royal Military Canal which is variably maintained (although 2019 clearance may have affected the continued presence of *Helosciadium*) and includes sections with a good quality flora.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Lamberhurst	TQ63Y		After 1970, before 1981	Philp, 1982	[There are earlier records, 1938-1956, from which it appeared that it grew in a ditch near the River Teise, south of Lamberhurst Church.]
Chilston Pines and Ponds, Lenham	TQ 8950	Heaths Countryside Corridor site	(1) 24 May 2015 (2) 26 July 2011. (There are previous records.)	(1) LR & SL (2) SB	(1) In flower, TQ 891 507, abundant in shallow margins of circular pond, associating with liverwort *Riccia fluitans*. (2) TQ 89148 50767: about 2000 small non-flowering plants around muddy margin of round shallow pool (the former ice pond of Chilston Manor Estate) between Lenham Heath Road and the M20; some submerged plants with fruits. Associated flora included *Ranunculus aquatilis* and *Myosotis laxa*.
Hale Street	TQ6848		1983	JP	[Also recorded in 1954 by FR from a pond on gravel, TQ 683 493.]
Woodchurch	TQ93L		After 1970, before 1981	Philp, 1982	
Appledore	TQ93Q		(1) 15 July 2019 (2) 7 June 2019 (3) After 1970, before 1981	(1) JP (2) DM at KFC meeting (3) Philp, 1982	(1)TQ9731. [A week later, JP found that the ditch had been dug out, with no trace of *Helosciadium* remaining.] (2) TQ 97466 31021, and TQ 97426 30975, two patches in ditch on the north side of the Royal Military Canal (3) TQ93Q.
Plumpton Farm, Hinxhill	TR0542		(1) After 1990, before 2006 (2) 2001 (3) 1988	(1) EGP (Philp, 2010) (2) JP (3) PGl	(1) Recorded as TR04L. (2) c. TR 0587 4267: in shallow pond on gault clay. (3) TR 058 427. [There are records for Hinxhill back to 1956 (FR).] In 2011 the shallow pools were reported as covered with *Crassula helmsii.*

Lenham, vegetative *H. inundatum*.
Photo by Lliam Rooney, 9 September 2011

Lenham, habitat.
Photo by
Geoffrey Kitchener,
1 December 2015



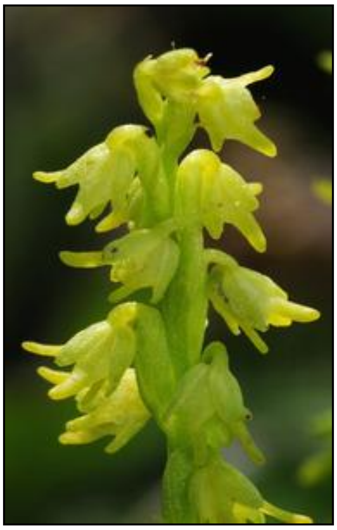
Lenham. Photo by
Lliam Rooney,
24 May2015

Herminium monorchis (L.) R. Br. (Musk Orchid)

vc 15 and 16

Rarity / scarcity status

Herminium monorchis is local in south England, absent from the south west. A continuing decline, only partly off-set by new colonisation, has led to the species being regarded as **Vulnerable** to the risk of extinction in the British Isles. However, an assessment of English data (albeit that Musk Orchid does not currently grow in other parts of the British Isles) has resulted in it being considered **Endangered** and so facing a high risk of extinction in the wild. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 54%, a dangerously high amount, in the likelihood of recording the species. This decline (although measured over a different period and on a different model) is also reflected in the 50% reduction in tetrad records between the county botanical surveys of 1971-80 (Philp, 1982) and 1991-2005 (Philp, 2010). It is a species of principal importance under s.41 Natural Environment and Rural Communities Act 2006 and its Kent occurrences are largely on SSSIs. It is **scarce** in Kent. It is a Kent axiophyte and so is indicative of good habitat.



Birling Hill. Photo by Lliam Rooney, 28 June 2010

Account:

In Kent, the first published record for Musk Orchid is by Christophe Merrett as Frisland Lady-traces 'on *Gads-hill* in *Kent*, and neer *Greenhith*' (*Pinax rerum naturalium Britannicarum*, 1666). Hanbury & Marshall (1899) summarised its status as not uncommon, though local, on grassy banks and downs on the chalk. From the (then) historical records and those provided for their *Flora of Kent*, it is apparent there was a distributional focus in north west Kent, not just in the Halling/Cuxton area, where it may still be found, but scattered along the North Downs escarpment (east to west) from Birling through to Wrotham, then west of Otford, where the River Darent breaks through the chalk hills and to a chalk pit at Morant's Court Hill above Dunton Green. The pre-1899 escarpment pattern could have been extended to Chevening if Hanbury and Marshall had been aware of the Rev. H.L. Jenner having collected the species there, where he was curate, in 1845[293].

This downland distributional focus included the steep-sided chalk valleys running northwards along the downs dip slope, which may account for the record at Halstead (a specimen collected by the pioneer photographer, Anna Atkins) and would certainly account for the record between Cudham and Downe. The latter site presumably corresponds to Darwin's Orchis Bank, from which the observations on the structure and pollination of Musk Orchids in his writings[294] are drawn. The Halling/Cuxton concentration was also noted as spreading east of the River Medway, where it breaches the North Downs, so as to include Boxley and the chalk hills between Rochester and Maidstone. The second main area of distribution was in East Kent, along the downs from Wye, including the Kneading Trough, to Stowting; and extending northwards where the Great Stour cuts through the North Downs so as to include Chartham Downs and Crundale; together with the chalk valleys running northwards along the Downs dip slope – between Lyminge and Elham (where the species is still present, at Park Gate), to Bishopsbourne and Barham. There were also some outliers: on the downs about St Margaret's, and (perhaps not a trustworthy record) from Thanet.

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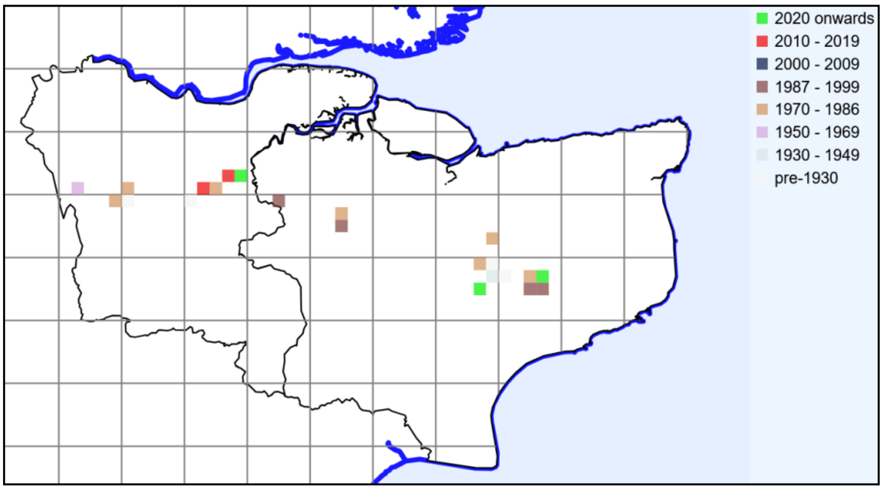
[293] Specimens at Kew and University of Birmingham.

[294] C. Darwin (1862). *The various contrivances by which orchids are fertilised by insects*. The second edition (1877) includes a expanded commentary as regards how his son, George, had made out the details of the fertilisation process, involving very small insects crawling backwards into the flower and picking up pollinia on their front legs, which then get carried to other flowers. George is mentioned as having brought home insect specimens illustrating the process. The Orchis Bank, as being near to home, would have been the obvious place for study and the presence of the orchid there is attested by Darwin's daughter, Henrietta Litchfield ('Here grew bee, fly, musk, and butterfly orchises') in her account of her mother, *Emma Darwin Wife of Charles Darwin a Century of Family Letters* (1904). The site for Darwin's Musk Orchid appears to have been north of the current KWT reserve, as mentioned in F H. Brightman (1963), Darwin's musk orchid bank at Downe, Kent, *Trans. Kent Field Club*, **1**:.150-154 (which contains an account of an abortive attempt to restore the species here by raking off moss and matted grass).

Ladd's Farm. Photo by Lliam Rooney, 29 June 2013

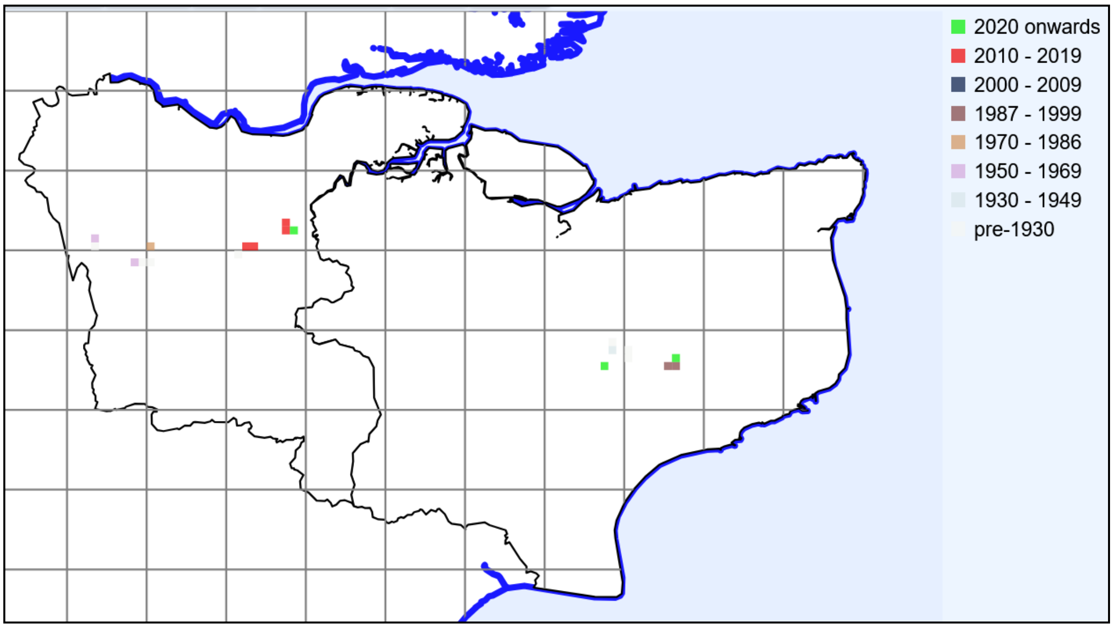
Much of this range of occurrence continued through the 1940s and 1950s and, in a somewhat attenuated form, into the 1970s. Francis Rose's records included sightings along the downs scarp from east to west at: Chevening Park (short *Festuca ovina* turf on chalk slope with west aspect, 1951-4); Polhill (chalk downs near railway tunnel, 1949); Wrotham (downs to the east, 1945); Trosley Downs above Wrotham Water (1950); and Hollingbourne Hill (short turf on an old spoil heap, 1959). These and others of his records are evidenced by specimens at **MNE**, where there are some 65 pressed spikes. In his manuscript Flora he referred to there being 23 localities, although listing more than 23. By the time of the county survey of 1971-80, the extant Kent sites were reduced to 12 tetrads, but still spread out from Chevening in the west to Park Gate in the east. The 1991-2005 survey showed a comparatively skeletal distribution of six tetrads, no further east than Wrotham Water/Trottiscliffe. This appears to be a fair assessment of the current position, given that 2010-24 records amount to only five tetrads (seven monads). Tetrad records, however, do not give much of an impression of local frequency; and whilst they show some clustering across the downs on the east side of the Medway Gap, it should be noted that this area is one in which there are a number of colonies, which appear to have increased with chalk grassland restoration, part of the Valley of Visions project (2007-2013). The largest Kent populations appear to be here and at Park Gate.



Herminium monorchis **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Viewing records at tetrad level (see distribution map above) assists an understanding of loss, especially from the 1970s onwards, when tetrad recording became the norm. Viewing at monad resolution (see distribution map below) results in a selection of primarily recent records, given that monad recording only became the norm in Kent from 2010, and shows the degree of concentration at the downs on the east side of the Medway Gap and further westwards.

***Herminium monorchis* Kent records to 2024 mapped at monad level, from BSBI database.**



Holly Hill, habitat. Photo by David Steere, 15 June 2014

Herminium monorchis is a small plant, generally no more than 15 cm high, requiring a calcareous habitat where it is not out-competed by taller vegetation. This may be where chalk turf is maintained low through grazing, or on steep slopes where other vegetation is slow to take hold.

Numbers of plants are generally assessed by counting inflorescences, but what constitutes an individual is not necessarily straightforward, given its ability to spread through tubers forming at the end of rhizomes from the originating plant. The result may be a clumped colony; David Johnson refers[295] to having encountered above Wrotham in 1986 several clumps of up to 35 flowering plants, in the context of a population of over 1,000 spikes. Flowering may vary from year to year, and study of out-county populations has shown that flowering individuals do not exceed just over a third of the population and the species is adversely affected by drought and high temperatures in the preceding summer, perhaps reducing leaf area and drying up leaves so that energy reserves are insufficient to promote full growth in the following year[296]. For example, a colony at Birling Hill bore over 50 flowering spikes in 2009; five in 2010; and only one in 2011. Musk Orchid may be overlooked when in flower, due to its small size. When present as a non-flowering rosette it is exceedingly difficult to find, unless the exact spot is already known.

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[295] Johnson, D. (2019). *Wild Orchids of Kent*. Kent Field Club, Brighton.

[296] T.C.E. Wells, P. Rothery, R. Cox & S. Bamford (1998). Flowering dynamics of *Orchis morio* L. and *Herminium monorchis* (L.) R. Br. At two sites in eastern England. *Botanical Journal of the Linnean Society* **126**: 39-48.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Downe (metropolitan vc16)	TQ4461	SSSI	1996	JP	TQ 440 613, Gorringes Farm slope, north of Downe Bank KWT reserve.
Polhill	TQ5060	Operational railway land.	17 June 1986	RoF	TQ 506 603, railway tunnel. Also claimed here May 2004 (Anon.) at TQ 505 619 on very bare chalk cliff above tunnel.
West of Trottiscliffe	TQ6260		6 July 2013	IJ	
West of Trottiscliffe	TQ6360	SSSI	(1) 27 June 2018 (2) 16 June 2018 (3) 3 July 2014 (4) 1 July 2013	(1) ME & DC (2) GH (3) & (4) DJ	(1) TQ 63048 60669, where 15 spikes; not seen, 2019. (2) comm. DJ, 9 spikes found TQ 630 607, with 3 *Ophrys apifera* and 50+ *Gymnadenia conopsea* in vicinity. (3) Two small plants still at TQ 630 607. (4) National Trust slopes above Wrotham Water, c. TQ 6305 6067. First appearance in this area for some time, comprising 47 spikes in three groups of five, one group of nine at TQ 63048 60671 and a group of 14 at TQ 63046 60680. Presumably similar site to that recorded by FR in 1950 and by JBMin 1936 (dry bushy bank between Hogmore Lane [this is the track through Hogmore Wood] and Pilgrims Road).
Crookham Wood and Birling Hill	TQ6762	SSSI	(1) various, 2010-18	(1) various	There are a number of sites within this monad, which accounted for many records during the period 2010-15, which can only be summarised here. The original data give many individual plants, with ten-figure grid references. This is an exceptional location, both for the number of plants and their widespread occurrence. (a) Ladd's Farm field at TQ 673 629, 158 plants, in scattered locations, 2012. The KWT count for plants in this area in 2013 was 384. (b) South-facing scarp slope at Birling Hill, TQ 675 623, near a *Sorbus aria* tree. Over 50 flowering spikes in 2009; five in 2010; one spike in June 2011; groups of five and three in June 2012; groups of five, two and a singleton in 2013; three spikes in 2014, one in 2015. Initially unaffected by scrub clearance c. 2012, but by 2015 tall grasses and a thick thatch had developed, so the habitat was less suitable. In 2018, 2 spikes c.1m apart in quite thick, long grass (not found in 2016, 2017, 2024). (c) TQ 678 629, Valley clearing in mixed deciduous woodland, opened up by footpath crossing vehicular access-way, with tree/scrub clearance in vicinity of junction. Very thin soil over chalk. In 2010, two groups of three and two singletons. In 2011, only one trodden spike, the area being used as an ad hoc picnic site. Six recorded in 2013 appear also to belong to this site. (d) Ladd's Farm field between Crookhorn and Hangingfield Woods, TQ 675 632, three plants in 2012.
North of Crookham Wood	TQ6763	SSSI	(1)15 June 2014 (2) 6 July 2012	(1) DS (2) LM	(1) TQ 676 633, two plants together, one with a sawfly caterpillar, on a chalk grassland slope. Also present: *Ophrys insectifera*, *O. apifera*, *Dactylorhiza fuchsii*, *Anacamptis pyramidalis*, *Neottia*

					ovata, *Cephalanthera damasonium*, *Gymnadenia conopsea*. (2) Ladd's Farm field with south east facing slope, TQ 675 632; 13 scattered plants (10 figure grid-references given).
Crookham Wood and Birling Hill	TQ6862	SSSI	(1) 1 July 2024 (2) 19 June 2016 (3) 18 June 2012 (4) 2012	(1) LM & LR (2) DS (3) LM (4) FB, DM, JS	(1) TQ68350 62857. Lad's Farm Field 4, two spikes. (2) South of Crookham Wood. Known site, 30+ spikes seen among *A. pyamidalis* and *D. fuchsii.* (3) An area closely associated with TQ6762 and TQ6763 above. Ladd's Farm field with south-east facing slope, TQ 683 628, 82 plants, in scattered locations, in 2012. (4) 202+ plants seen c. TQ 684 628 under two pylons in meadow south of Ladd's Farm.
Hollingbourne Hill	TQ8555	SSSI	(1) 1998 (2) After 1990, before 2006	(1) BB (2) EGP (Philp, 2010)	(1) TQ 8516 5583, 90 flowering spikes counted on path across chalk pit, hundreds present in chalk pit. (2) Given as TQ85M, and assumed to be this monad.
Wye Downs National Nature Reserve	TR0745	National Nature Reserve, SSSI	(1) 17 July 2022 (2) 10 July 2021 (3) 23 July 2011	(1) (2) & (3) AG	(1) Two fruiting in their usual spot on the eastern arm of the Devil's Kneading Trough at TR 07740 45103. (2) TR 0773 4509 one flowering spike in the usual place. (3) Devil's Kneading Trough, TR 0773 4509, one spike in flower in short grass on a very steep terrace halfway down the eastern arm of the Kneading Trough just above an isolated wayfaring tree. Recorder saw seven spikes here in 2008 but none in 2010. It was noted here (two flowering spikes) as TR 0778 4500 in 1980.
Crundale Downs	TR0847	SSSI	9 July 2009	AG	Fanscombe Bank near Pett Street Farm, TR0 0811 4731, two flowering spikes and two blind rosettes in a small patch of short herb-rich grassland on Tor-grass dominated east-facing slope. There is a 1946 record by FR from Pett Street Down.
Park Gate	TR1646	KWT reserve, SSSI	(1) 29 June 2022 (2) 2 July 2012 (3) 8 August 2011 (4) 3 July 2011 (5) 23 June 2011	(1) & (2) CO (3) AG (4) WR (5) SB	(1) 24 spikes in 3rd compartment Parkgate Down NR. All but one in central area. (2) At least 500 flowering spikes, third paddock. [The KWT 2010 count for the reserve was 850.] (3) TR 168 460, 234 spikes. (4) 88 spikes at and around TR 168 460. (5) Five spikes on chalk grassland bank at TR 16870 46041. There are many records for Park Gate, including FR, 23 June 1981, 266 inflorescences.
Covert Wood	TR1848		22 June 1985	KFC meeting, FR	A few young plants on sheep-grazed chalk bank accessed from Forestry Commission car park.

Himantoglossum hircinum (L.) Spreng. (Lizard Orchid)

vc 15 and 16

Rarity / scarcity status

Himantoglossum hircinum was in the British Isles restricted to Kent until the early 20th century, when it expanded its range as far as Yorkshire in the north and Devon in the west. It declined after 1934 and is now an uncommon plant of south east England and the Channel Islands, nationally scarce although with a conservation risk status of 'Least Concern'. It is protected from uprooting, picking and sale under the Wildlife and Countryside Act 1981 as amended. The number of sites for this species in Kent is such that it does not qualify as rare or scarce in the county, but the most important population in the British Isles is at Sandwich and the second largest (perhaps even having become the largest by 2023, albeit threatened by development) is at Betteshanger Country Park. The concentration of records generally in Kent is also exceptional on a national basis. It is a Kent axiophyte, and so is an indicator of good habitat.

Sandwich Bay. Photo by Lliam Rooney, 22 June 2010

Account:

The first record for this spectacular species in Kent (and the British Isles) was by Thomas Johnson in his *Mercurius Botanicus* (part 2, 1641) as 'nigh the highway betweene Crayford and Dartford'. The species remained present in various locations in the Dartford area for at least 200 years according to Good, 1936[297]. There are examples credited by John Ray in his *Synopsis Methodica Stirpium Britannicarum* (1724) to the London apothecary, William Rouse: 'From the Street named *Lofield* in *Dartford*, is a Place called *Fleate-Lane*, and about a Bow-shot on the left Hand are several Plants of it. Also beyond *Dartford* is a place named the Brent, and on the right Hand a great High-way going to a Village called *Grimsteed* Green [Green Street Green], a little way on the right Hand you may also find it.'

Good (1936) considered that this first distributional phase ended with a Dartford record in 1867, although this approach disregards, or treats as casual or peripheral, some later finds, e.g. at Greenhithe in 1878-9 and 1883. Good's second distributional phase, partly overlapping the first, relates to sporadic, mostly transitory records between 1796 and 1899 in East and West Kent, and other south eastern counties. This phase ends with the assessment for Kent by Hanbury and Marshall (1899) that the species had always been very local and was then verging on extinction. The third phase was one of expansion, beginning in the 1900s and gathering pace from 1919 and reaching a peak in the early 1930s with new localities in many counties, but particularly in East Kent.

The explanation given was that the Lizard Orchid was in England at the northern limit of its Continental distribution and it occurred most abundantly in west central France, where the climate is typically oceanic. An increase in winter and spring temperatures and rainfall in central and southern England during the period 1901-30 in comparison with 1851-1900 suggested that, for a species on the borderline of climatic tolerance in south east England, this increase, tending towards a more oceanic climate, was of major significance. Not only did Kent become more suitable, but so did much more of the country.

The position was re-assessed by Carey (1999)[298] in the light of a decline in the fortunes of the species from the 1930s at least until 1975. He affirmed that climate change was significant, but also found that two successive wet growing seasons (viz. September to August) that were not followed by severe drought were required to produce viable seeds. It subsequently appeared that these conclusions might not be fully transferrable to plants outside Kent, and that plant size in the year of flowering was critical for seed production generally, although in Kent the plant size during the previous year was important as well (hence the two wet growing seasons). Other factors identified by Carey as favourable to *Himantoglossum hircinum* include the change of attitude towards the collection of wild plants, which may have given rise to the greater persistence of populations since the Second World War, so providing the opportunity of spread from a core-population. This is particularly relevant to a site such as at Sandwich, albeit that Carey's modelling of spread predicted that seed dispersal by wind would normally be up to a few hundred metres. It may be that this modelling does not cater sufficiently for exceptional dispersal events, although Carey offered as an alternative distribution vector the activities of golfers in transferring adhesive seeds from golf courses where the species was present.

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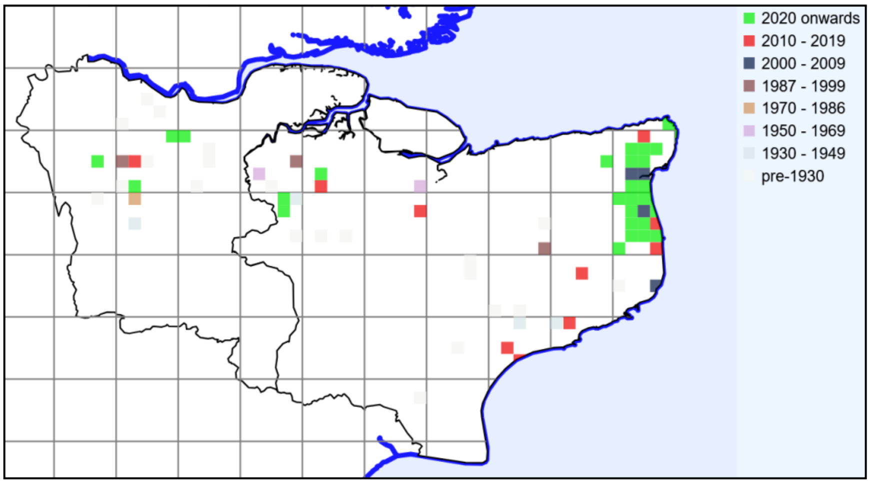
[297] R. Good (1936). On the Distribution of the Lizard Orchid (*Himantoglossum hircinum* Koch). *New Phytologist* **35**: 142-170.

[298] P.D. Carey (1999). Changes in the distribution and abundance of *Himantoglossum hircinum* (L.) Sprengel (Orchidaceae) over the last 100 years. *Watsonia* **22**: 353-364.

The surveys published in Philp (1982) and Philp (2010) indicate an expansion after the 1970s. The former survey (1971-80) located the species in only six tetrads, and described the plant as one of fixed sand-dunes and occasionally present by woodland margins or in scrub. The only population then regarded as regular was at Sandwich Bay, where the numbers of flowering plants varied greatly from season to season, and this accounted for five of the six tetrads, the remaining record being on chalk downland at Otford in 1978, an example of the 'come and go' characteristic appearances of this species. However, during the course of the 1991-2005 survey, 17 tetrad records were made as a result of the species appearing in a number of new localities, with the result that the overall population was probably then the highest ever known in the county. Carey & Farrell (2002)[299] considered that the turn-around point for the fortunes of this species in England was around 1994. This trend of new appearances has continued since, and our 2010-24 records cover 39 tetrads (53 monads), but not all the same ones as found in 1991-2005. The species has even (2019-24) appeared near Chelsfield Station in metropolitan West Kent.



***Himantoglossum hircinum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Seven current populations warrant further remark: those at Lullingstone, Boxley, Faversham Golf Course, Manston airport, North Foreland, Betteshanger, Great Stonar and Sandwich Bay. The Lullingstone Park colony is at present the only long-term West Kent population (but the Chelsfield colony may be added if it persists, the number of plants having risen from one to 20 between 2019 and November 2024), having first been discovered in 1993, when there were three flowering spikes[300], although its status needs updating The site, within a golf course, is known as the orchid bank, several other species being present, most notably *Anacamptis pyramidalis* (Pyramidal Orchid) in thousands and *Orchis anthropophora* (Man Orchid). It is a south-facing grassy chalk bank in a dry valley leading off the Darent Valley and it escaped ploughing and agricultural 'improvement' in the 1950s, and scrubbing over plus tree planting (since removed) in the 1970s. The bank has generally been cut and cleared with conservation in mind since then, and *Himantoglossum hircinum* has been a regular feature, albeit always with more rosettes in March than flowering spikes in summer. The best flowering year was 2006, with 18 spikes, but there have been occasional years without flowering, including 1996 and 1997 which correspond to the crash in Sandwich Bay numbers (see below); and 2017 was a year in which no rosettes were seen, let alone flowering plants (according to David Johnson). Individual plants may in any event be erratic in flowering: David Johnson noted a Lullingstone Park plant flowering in 2007 which appeared to be the same as one which had flowered in 2000, but not since[301].

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[299] P.D. Carey & L. Farrell (2002). *Himantoglossum hircinum* (L.) Sprengel (Biological Flora of the British Isles). *Journal of Ecology* **90**: 206-218.

[300] The Lullingstone Park colony is described by:
(1) David Johnson (2005). Lizard Orchid *Himantoglossum hircinum* at Lullingstone Park, West Kent (v.c. 16). *Kent Field Club Newsletter* **61**: 2-4;
(2) Joyce Pitt (2007). Chalk Bank in Lullingstone Park, *Kent Field Club Newsletter* **66**: 3-4.

Boxley, roadside habitat. Photo by David Steere, 25 June 2014

Boxley is an example of a sudden, seemingly random, appearance of the species in a new location and was first discovered in 2012 on a roadside which had been realigned in the course of the construction of the High Speed 1 rail route, 1999-2003. There were two flowering spikes, which would be similar to many impersistent occurrences of the odd plant or two. However, in 2014 there was a population explosion, with 80 rosettes seen, resulting in 35 flowering spikes. If these derived from seedlings produced from a plant or plants in situ, then those plants would have to have been present and flowering for at least six years before initial discovery to permit germination and maturation. The expansion continued in 2015, with 99 flowering spikes, two of which were on adjoining railway property, settling back in 2016 to 60 spikes, although extending in area. The colony then went into decline, with only four plants in 2022 and 2023. Again, this is a site with other orchid species present, including *Anacamptis pyramidalis* (Pyramidal Orchid) and *Orchis anthropophora* (Man Orchid), which may be relevant for mycorrhizal associations. The expansion has a more recent parallel in a roadside colony at Great Stonar (see below).

Faversham Golf Course seems never to have held many plants at any one time, but the first record here was in 1922 and the species has been seen here at intervals up to 2012; its status needs updating. Whether these intervals are related to sporadic appearance or sporadic survey is not clear; but there is evidence of long persistence.

Manston airport (closed since 2014, but with a development consent order granted in 2022 for re-opening) may well have harboured plants for some time before 50 were noted in 2022; but other than as regards some roadside plants, the site has not been readily accessible. A 2024 survey, however, found 695 plants, mostly in TR3466.

At North Foreland is a colony deriving from two plants found in 1996. It is located in chalk grassland between Cliff Promenade and the coastal cliffs, sometimes with plants at the cliff edge. Numbers grew to 75 flowering plants by 2006 and 102 by 2009. A count in 2013 gave 116 flowering plants, which, at least for that year, may have made this the third largest colony in the British Isles, after Newmarket and Sandwich Bay. Whilst numbers of flowering plants had fallen to 106 in 2015, this may have reflected dry weather in late May and June, as the area of the colony seems nonetheless to have expanded. In 2024 there was a count of 70 flowering plants, but this was not a complete survey.

Betteshanger, like Boxley, is a colony which has recently appeared and has expanded very rapidly, so much so as to have become the second largest population in the British Isles, ranking only after Sandwich. Betteshanger (formerly Fowlmead) Country Park was a spoil tip for a colliery which closed in 1989 and was converted to a park, opened in 2007, by the addition of recycled green waste to the sharp-draining shale substrate, perhaps also including calcareous material excavated during development of the White Cliffs

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[301] David Johnson (2008). The Lizard Orchid *Himantoglossum hircinum* at Lullingstone Park. *Kent Field Club Newsletter* **67**: 6-7.

Business Park. There were occasional sightings of individual Lizard Orchids: in 2000 (away from the current site), in 2007 and 2011 after which it spread exponentially: 26 flowering spikes in 2015, 145 in 2017, 694 in 219. Then in 2022 planning permission was sought to develop a substantial part of the site occupied by the colony with an artificial surfing lagoon and holiday accommodation, translocating orchids which were in the way. The ecological report accompanying the planning application disclosed a survey with a count of 3,193 flowering spikes, albeit that the number was confusingly stated and generated a population estimate of 5,300. Natural England concluded that the proposal was likely to have a significant harmful effect on a nationally important population by destroying the habitat for a quarter of the known population, and that translocation was unproven, uncertain and at an unprecedented scale.[302] Nevertheless, planning permission was granted, conditional upon translocation being licensed by Natural England.

Great Stonar is a colony of which the first (eight) plants were found in 2016 and which expanded with extraordinary rapidity to at least 2019 flowering spikes by 2020. It is in a habitat of chalk road-verges which was only created around 2004 and relates to the A256 and the road system serving Discovery Park, Sandwich. It may be regarded as distinct from the Sandwich Bay aggregate of colonies and, as such, is (2020) the second largest population in the county.

Sandwich Bay, dune habitat. Photo by Sue Buckingham, June 2009

The Sandwich Bay population is, by a long way, the largest in the British Isles. It is spread over a large area, primarily the Royal St George's and Prince's Golf Courses and their surrounds (including Sandwich Bay estate lawns and road-verges) and, whilst it might be regarded as a series of sub-populations extending over several monads, there is a case for treating at least the main concentrations as a single population, described in Carey & Farrell (2002) as covering an area of 1 x 0.5 km and containing over 5,000 flowering plants in 2000. If one extrapolates on the basis that only 14.5% of rosettes may flower, this total implies a population in 2000 of 27,500 plants. Carey & Farrell (2002) give flowering plant data from 1950: numbers did not exceed 1,000 until the late 1980s, rising to over 3,000 in the early 1990s, falling to 1,500 in 1995, then a population crash in 1997 due to exceptionally low winter rainfall in 1995-6 and 1996-7, recovering to record levels by 2000. The population is thought to be of pre-war origin: there is a 1924 specimen in BM collected by G. Field-Marsham from golf links near Sandwich; and St George's Links is mentioned in a 1944 record by Moore-Brabazon (presumably Baron Brabazon of Tara, of Sandwich, a keen golfer). It looks as though it may originally have been known better here by golfers than botanists.

Himantoglossum hircinum grows mostly on chalk grassland or on calcareous dunes. The Boxley population at first sight might appear to be an exception, in an area of Gault Clay, but the substrate has been affected by the import of materials in the course of road and rail construction works. The species has been characterised as one of tall sparse grassland associated with an annual or biennial cutting regime, particularly in rough grassland adjoining intensively managed grassland (such as golf courses) or adjoining linear features such as roads. All these habitat characteristics are reflected in various Kent occurrences. Additional protection may be afforded at golf courses. Carey and Farrell (2002) refer to the practice, when plants grow on golf courses close to areas of play, of surrounding them by 'ground under repair' hoops, so that any ball landing near the plants can be moved by the player without penalty. They also refer to a management plan at Sandwich whereby nutrient enrichment of the dunes is minimised by depositing grass cuttings in specially dug pits or removing them altogether.

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[302] Lizard Orchid *Himantoglossum hircinum* (L.) Spreng. and Betteshanger Country Park, Kent, 16th February 2023. Dover District Council planning portal, application 22/01158.

Sandwich Bay, lawn habitat. Photo by Sue Buckingham, June 2010

The species over-winters as a rosette of grayish-green leaves, appearing from September onwards. Flowering in Kent is from early June into July, and David Johnson considers that the flowering season in Kent has moved forward a week since the 1970s. The flowers possess long lips with side lobes that are supposed to give the appearance of the legs and tail of a lizard clambering up - ‘in forme like unto a lizard, because of the twisted or writhen tailes and spotted heads’ according to John Gerard in his *Herball*, 1597, an account which is likely to have been based on Continental material, rather than supplying evidence of early occurrence in Kent.

Data for this species are here presented in both map and tabular form. In view of the number of finds (and the ‘come and go’ nature of the species, the table is focused primarily on records for 2010 onwards, with some earlier occurrences for those sites to indicate trends or first records. Records are also included for locations post-dating the 1991-2005 survey in Philp (2010).

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Chelsfield station (metropolitan vc16) m	TQ4664	L.B. Bromley public open space	(1) 14 November 2024 (2) 13 June 2024 (3) 6 June 2022 (4)16 June 2021 (5) 13 February 2019	(1) ES (2) GK (3) SLo (4) SLo (5) ES	(1) Colony now increased to 20 rosettes (2) TQ 4673 6410, original plant now has 2 flowering spikes, a third has appeared c.10m to west, away from footway, grassland under trees, unmown. LB Bromley's contractors apparently aware of risk to plants from planned felling of ash trees. (3) Still present. (4) TQ 465 641, Aspen Wood [usual plant]. (5) TQ 46736 64101, in the triangular public open space (mown grass and trees) opposite the Chelsfield pub, c. 1 metre in from the tarmac footway which forms the south eastern boundary. A rosette of basal leaves a few inches across. Seen, GK, 19 Feb 2019.
Shoreham/Otford	TQ5260		24 June 2022	GHo	One plant in private garden, Wynbriar House, Shoreham Road, chalk grassland slope.
Lullingstone Park	TQ5264	Golf course / country park owned by Kent C.C., leased to Sevenoaks D.C. [Orchid site is outside	(1) 21 June 2019 (2) 20 June 2018 (3) 27 June 2015 (4) 10 June 2014 (5) 22 June 2013 (6) 25 June 2012 (7) 10 June 2011	(1) – (7) DJ	(1) TQ 520 643, four flowering plants at golf course (there were none in 2016, 2017). (2) Three flowering, one good spike standing 50+ cm and two rather small stunted specimens at and around TQ 520 643. (3) c. TQ 520 643, four flowering

		SSSI.]			spikes of which two were very small, two modest (35-40cm), although 11 rosettes were seen by recorder on 11 March 2015. Site has had most of hawthorn and other scrub removed over previous winter. (4) TQ 520 643, one poor flowering plant with about half a dozen florets, with a couple of gone-over *Orchis anthropophora*. Four rosettes seen in late February. Orchid bank looked to be scrubbing over and may not have had winter cut. (5) c. TQ 5204 6428, three plants flowering, only about half open at this time and one spike did not mature. On 3 March there were 16 rosettes, 9 of which were small. (6) Three plants flowered around TQ 5204 6428 including one superb spike 70cm tall. In March there were 18 rosettes. (7) Four flowering spikes, after 17 rosettes had been counted on 8 March. First discovered 1993.
Longfield	TQ5969		(1) 11 July 2021 (2) 17 June 2020 (3) 14 June 2019	(1) (2) & (3) DS	(1) Final count for 2021 at this site, including railway land not previously visited. Four flowering spikes under *Prunus avium* at top of site at TQ 59835 69675. One flowering spike at previously recorded location at TQ 59783 69600 and a sighting of one more spike originally found a couple of weeks previously by LS Lindsay Stronge at TQ 5969 6948 now seen and confirmed by DS. So there are now six spikes at this site. (2) Recorder watched an emerging spike growing and beginning to put up a flower spike from early May, only for it to completely die off due to drought. Dead by 17/06/20 prior to flowering. Same plant as seen in 2019. (3) One flowering spike c. TQ 59783 69612 bordering the HS1 railway link line. Not seen at this location before nor since 1921 in Dartford Borough.
Longfield	TQ6068		June 2021	NT	One plant on roadside bank off Hartley Road [apparently Ash Road at the relevant point], maybe c. TQ 60214 68758. The bank was later cut by KCC and plant not seen afterwards.
Penenden Heath	TQ7757		22 May 2022	DO	TQ 77821 57129, one plant flowering on tiny patch of grass north of and adjoining Next store, a few bee orchids also present in leaf.
Boxley	TQ7758		(1) 10 June 2023 (2) 7 May 2022 (3) 24 June 2016 (4) 29 June 2015 (5) June 2014 (6) July 2013 (7) June 2012	(1) JS (2) SCo (3) & (4) DJ (5) & (6) Various botanists (7) AH	(1) Only 4 rather poor plants from previous large population. (2) TQ 77016 58519, four rosettes on the opposite side of the road to the usual verge, They were tucked under the hedge feet from the gateway to the SW. Three will flower, one blind. (3) 60 spikes (several in range 75-

					95cm), less than 2015, but now present (1 plant) on opposite side of road. *O. apifera* now present in main colony. (4) Roadside colony continues dramatic expansion. Recorder counted 97 flowering on roadside and two further spikes over fence on railway property. Remarkably robust, some five or six plants exceeded a metre in height, with actual flowering spikes of 35-40cm, and many others were over 75cm tall. There were also c.50 *Anacamptis pyramidalis* spread along verge and two *Orchis anthopophorum* in the middle of the colony. (5) The same roadside site as recorded in 2012-13, but now 35 spikes flowering (from 80 rosettes in spring), best 80cm high but many in range 60-70cm. Concentrated along 10 metres or so of lightly scrubbed roadside verge with one flowering on far side of railway fence. *Orchis anthropophora* and *Anacamptis pyramidalis* also present. (6) The two 2012 plants flowered again, even larger: one 69 cm tall with a flowering spike of 30 cm and the other 97 cm tall with a 46 cm spike. Location variously given as TQ 77028 58419 or TQ 77032 58410. (7) Highway verge on east side of Boxley Road, near rail link. Shortly afterwards, noted by DJ as comprising two fine spikes 80cm and 60cm tall at TQ 7701 5842. This location is on the Gault Formation, but the superficial geology has been affected by rail and road construction (1999-2003). There is probably no connection, but the orchid was reported from Boxley in 1909 (*East Kent Scientific & Natural History Society Report for year ending 30 September 1909*).
A249, Stockbury	TQ8360	KWT roadside nature reserve	14 June 2014		One plant on chalk bank by the A249 at TQ 83238 60358, with *Orchis anthropophora* and *Anacamptis pyramidalis*. Reported as not flowering, 2015. DJ (pers. comm.) suggests the possibility that KWT wardens or volunteers may be unwitting vectors of the adhesive seeds, to give rise to this occurrence.
Queendown Warren	TQ8363	KWT reserve, SSSI	(1) 25 June 2016 (2) 29 June 2015 (3) 2014 (4) 30 June 2013	(1) (2) & (3) DJ (4) SD	(1) Flowering for 4th consecutive year. (2) TQ 831 631, the plant previously recorded flowered for third consecutive year. (3) The plant recorded in 2013 flowered again. (4) A single flowering plant at TQ 8311 6308, in short grassland at top of main bank of reserve, said to be the first since 1966.
Faversham Golf	TQ9956,		(1) 31 May 2012	(1) LR	(1) TQ 99242 57003, one plant.

Course (Belmont Park)	TQ9957		(2) 1997 (3) 4 March 1987 (4) 1959 (5) 1922	(2) NS (3) RoF (4) FR & HW (5) HE	(2) TQ 9912 5692, nine rosettes. (3) TQ 992 570, two plants. (4) TQ 993 571, Belmont Golf Club.
Pedlinge	TR1335		(1) 8 June 2016 (2) 4 January 2015 (3) 11 July 2013 (4) 15 July 2006	(1) SC (2) GK & SK (3) LR, GK & AG (4) PB	(1) TR139357, four plants. (2) One rosette on church lawn, TR 1397 3571. (3) On church lawn, one flowering spike and another eaten off, despite protection. (4) Two plants, reported to have been present since 2004.
Hythe Ranges	TR1533	MoD land	29 June 2013	SB & OL	One plant with three flowering spikes at TR 15377 33999.
Etchinghill escarpment	TR1639		June 2007	BL	TR 167 393, mainly single plants. [Apparently an approximate grid reference.]
Holy Well, Folkestone	TR2237	SSSI	June 2007	BL	TR 226 377, mainly single plants. [Apparently an approximate grid reference.]
Folkestone Downs	TR2238	SSSI	2012	PG	TR 223 382, also flowered c.5 years beforehand.
Lydden Hill	TR2546		March 2011	GT	Three rosettes on the central reservation roadside nature reserve along Lydden hill at TR 2537 4612 within two metres of road. Last flowering here was 2007.
Monkton	TR2865	Nature reserve	(1) 19 June 2024 (2) 7 June 2023 (3) 2005	(1) CN (2) KBRG meeting (3) KWT	(1) One recorded for annual Monkton orchid count. (2) Monkton chalk pit, 4 spikes in bud at around TR 2846 6565. (2) TR 284 656, present in small numbers in chalk pit.
Tilmanstone	TR3051		(1) 1 July 2024 (2) 12 June 2024 (3) 25 June 2023 (4) 24 June 2023 (5) 21 June 2018 (6)5 June 2016	(1) SC (2) CN (3) CN (4) SC (5) SC & ML (6) GH	(1) One plant, TR 3059 5123. (2) 228 clumped on verge of A256 at c. TR 306 511. (3) 130 counted on the southbound carriageway of the A256 (Sandwich to Dover dual carriageway) between Eastry and Tilmanstone roundabouts from TR 30629 51020 to TR 30622 51129. (4) One spike in deep shade TR 30636 51792. (5) Four at TR 30519 51612. (6) TR 305 515, one plant.
Sandwich west	TR3158		26 June 2021	DS	One flowering spike seen on west verge of A256 by roundabout while queuing in traffic.
Sandwich south west	TR3256		(1) 5 June 2024 (2) 28 May 2020	(1) AL & JM (2) AB	(1) TR 322 567. Two large spikes beside the road. (2) TR 3220 5670, one flowering spike on A256 (more than 2.5 miles from nearest plant in the large Great Stonar A256 colony).
Great Stonar, Discovery Park	TR3259, TR3358		(1) 13 June 2024 (2) 17 May 2024 (3) 3 September 2023 (4) 7 July 2023 (5) 26 June 2021 (6) 28 May 2020 (7) 22 July 2018 (8) 8 June 2017 (9) 22 May 2016 (10) 12 May 2016	(1) AB (2) SC & ML (3) SC & ML (4) ML (5) DS (6) AB (7) DCh (8) AB (9) SC (10) AB	(1) TR 334 589 to TR 326 596, both sides of Monks Way, plus TR 327 597 to TR 323 593, both sides of A256 (in all, presence in 2 monads), total 1,176 flowering plants. (2) 552 plants at by-pass north verge TR 3239 5942 to TR 3262 5964 (KWT RNR), 10 at south verge, 77 by gate TR 329 590, 83 central reservation c. TR 327 595, and 11 at east verge (3) About 100 spikes by roundabout TR3258 5960 (4) 26 by gateway around TR 3294 5901 (5) One flowering spike seen on west verge of A256 by roundabout

					while queuing in traffic. (6) 219 flowering spikes on A256 between TR 3295 5980 and TR 3215 5920, and Monks Way between TR 3265 5960 and TR 3330 5890. Count relates to what can be seen from road and verge, may be more beyond, behind scrub. (7) TR 32690 59600, five plants on waste ground near roundabout. (8) 133 flowering plants along the A256 in Sandwich, TR 321 591 to TR 328 597. (9) TR 329 590, four on new road verge. (10) Eight plants in tight bud on the road verge and adjacent area of the A256 near Discovery Park in Sandwich. They are c. 2 miles from the large colonies on the golf courses. Inside the crash barrier, so some protection from mowing, and also on a flat lower area which looks as though created to take excess rain water from the A256.
Northbourne	TR3352		29 May 2024	DS	TR 33834 52953, 11 spikes about to flower in short turf SE of footpath.
Worth	TR3355		5 May 2021	JVVD	Appeared for second year in recorder's garden at Worth TR 337 554.
Great Stonar	TR3359		13 June 2024	AB	(a) TR 334 599, East side of Ramsgate road, Discovery Park, unfortunately mowed soon after flowering commenced. (b) (1) TR 334 589 to TR 326 596, both sides of Monks Way, plus TR 327 597 to TR 323 593, both sides of A256 (in all, presence in 2 monads), total 1,176 flowering plants.
North Stonar	TR3360		(1) 13 June 2024 (2) 17 February 2022 (3) 28 May 2020	(1) AB (2) SB (3) AB	(1) A few plants on the A256 at TR 334 607 and TR 334 609, all on west side of road. (2) At least 30 rosettes on both sides of Ramsgate Road from TR 3339 6005 to TR 3340 6003 on the grass road verges, which are most probably mown. One rosette seen inside Discovery Park fencing. (3) TR 3335 6080, twelve flowering spikes at Richborough Recycling Centre.
Richborough Port – Stonar Cut	TR3361		(1) 13 June 2024 (2) 22 May 2023	(1) AB (2) SC	(1) TR 334 619, a few plants on east side of A256. (2) TR 33488 61906.
Manston south west	TR3365		May 2024	JE	65 plants around TR 338 658, airport runway area of herb rich grassland supporting calcareous indicator species.
Manston west	TR3366		(1) May 2024 (2) June 2023	(1)JE (2) CN	(1) 40 spikes from TR 332 664 to TR 336 666 in areas of herb-rich grassland and short grass areas among buildings. (2) Nine plants by Spitfire museum at TR 334 665.
Manston	TR3466		June 2023	CN	120 at c. TR 340 664.
Northbourne north east	TR3453		29 May 2024	DS	TR 34023 53157. Three spikes about to flower on grassy verge south east of pathway.
Worth Minnis	TR3455	SSSI, RSPB reserve	13 July 2022	SB	Nine tall flowering and fruiting spikes alongside a ditch on RSPB land, TR 343 556.

Sandwich Bay	TR3458	SSSI	16 June 2013	CO	Flowering by ditch on SE side of straight river embankment c TR 340 584.
Pegwell Bay	TR3463	National Nature Reserve, SSSI	(1) 23 June 2009 (2) 11 June 2004	(1) MT (2) JP	(1) TR 344 630. (2) TR 34209 63186, large plants in flower.
Manston south	TR3465		May 2024	JE	Four plants c. TR 340 658 (some of these may be in TR3366).
Manston	TR3466		May 2024	JE	539 plants in TR3466 at north side of B2050 by junction with Manston Road. Within that area, 177 are within a mounded area at c.TR 340 664 and 93 outside the airport on the road verge at c. TR 341 663.
Betteshanger (formerly Fowlmead) Country Park	TR3553		(1) 25 January 2024 (2) 1 July 2023 (3) 25 March 2023 (4) 12 October 2022 (5) July 2022 (6) 4 March 2022 (7) 26 June 2016 (8) 23 June 2007	(1) SB (2), (3) & (4) SB (5) AE (6) SB (7) SB (8) BL	(1) 46 rosettes counted on the bank overlooking the children's play area. TR 35332 53989. (2) Betteshanger CP, many hundreds flowering over the area of proposed development site within cycle track and particularly from TR 35118 53827 to TR 35347 53571. (3) Rosettes in good numbers under scrub on slope south west of country park roundabout at TR 3521 5397 about 200 here and as many on the top of the bank in the open near cycle track. (4) Betteshanger CP, 49 rosettes counted between TR 35210 53975, north-facing bank by roundabout, and TR 35118 53758 beside the cycle track. (5) 3,193 flowering plants (total obtained by summing all transect totals given by AE in Ecological Appraisal of August 2022) in Betteshanger CP, within area bounded by TR 3513 5374, TR 3528 5382, TR 3546 5367, TR 3551 5362, TR 3571 5375, TR 3556 5345, TR 3551 5342 and TR 3529 5350. Not all the surveyed area was accessible; it was described as grassland and open mosaic habitat. The Appraisal gives a total of 768 + c.2,400 (= 3,168), which does not quite accord with the mapped figures. A subsequent planning document estimates the population at c. 5,300, but the figures are confusing. (6) 15 rosettes seen at TR 35776 53745, 30 at TR 3516 5374, 10 at TR 3559 5341 and 1 at TR 3572 5357. (7) 61 flowering spikes in grassland counted by DML on 15 June 2016. 12 of these seen by SB on June 26 between TR 3521 5377 and TR 3527 5363. (8) TR 35519 53400, one plant in full flower.
Betteshanger Country Park	TR3654		15 June 2016	DML	TR362541, gridref inferred from map dated 15 Jun 2016 by recorder, far east side of country park, one plant.
Sandwich Bay	TR3557	SSSI	3 June 2010	GK	Scattered on dunes of Royal St George's golf course, TR 35993 58045 (21 plants), TR 35999 58054 (six plants).
Sandwich Bay	TR3558	SSSI	(1) 15 June 2023	(1) SB	(1) Royal St Georges golf course,

			(2) 11 June 2013 (3) 24 June 2010	(2) CO (3) SB	hundreds flowering in the dune grassland, e.g. at TR 3546 5868, TR 3563 5867 and TR 3560 5871.. (2) Abundant in car park area. (3) TR 35824 58847, 42 plants scattered in dune grassland east of Princes Drive southwards for 200ms. Also TR 35864 58553, 36 plants in dune grassland in 'rough' of Royal St George's golf course.
Sandwich Bay	TR3559	SSSI	(1) 19 October 2023 (2) 26 May 2021 (3) 16 June 2020 (4) 3 July 2016 (5) 11 June 2013 (6) 23 May 2011 (7) 24 June 2010	(1) SB (2) SB (3) SB (4) AW (5) CO (6) & (7) SB	(1) Grassland within proposed Princes golf course project, 6 rosettes at TR 3565 5932, in front of hotel. (2) Old practice range TR 3508 5913, a sizeable colony in a hollow. A further colony of 40 + flowering plants at TR 35137 59338, recorded 02/07/21 (2) In a hollow with *Epipactis palustris*, TR 35506 59579. (2) Present. (3) A few plants on sand dunes close to beach at south end of monad. (4) One plant on dune grassland of Prince's Golf Club at TR 35426 59832. Another at TR 35301 59981. (5) TR 35168 59280, four plants in stabilized dune grassland.
Sandwich Bay	TR3560	SSSI	(1) 25 February 2021 (2) 23 May 2017	(1) SB (2) SB	(1) Approx 30 winter rosettes at TR 3532 6076 edge of Princes golf course and beside public footpath. (2) In good numbers alongside the road to Princes golf club at TR 3523 6023.
Sandwich Bay	TR3561	SSSI	25 February 2021	SB	Spread of some 200 winter rosettes in the rough on Princes golf course at TR 3522 6135, appears to be the furthest north that recorder has seen them in the dunes.
Nash (Thanet)	TR3568		13 August 2017	SC & ML	Two spikes on old bank TR 35564 68423.
Sandwich Bay	TQ3655		(1) 30 June 2019 (2) 8 June 2019	(1) SB (2) DS & EW	(1) A single plant beside the Ancient Highway TR 3676 5573 near the reservoir. (2) Single, but large flowering plant on east road verge c. TR 367 558.
Sandwich Bay	TR3656	SSSI	9 April 2017	SB	Two rosettes on a sandy bank by the sea at TR 3674 5663, looking to be as the result of some disturbance at the margin of the golf course. One more at TR 3643 5692 by a footpath.
Sandwich Bay	TR3657		(1) 28 June 2024 (2) 20 March 2024 (3) 4 February 2023 (4) 24 June 2020 (5) 18 February 2011 (6) 24 June 2010 (7) 3 June 2010	(1) , (2) & (3) SB (4) SW (5) & (6) SB (7) GK	(1) Still some allowed to flower on the lawn of a house in North Road on Sandwich Bay estate at TR 3610 5756. (2) 410 rosettes counted in a 50 yard stretch of Kings Avenue, northen verge, Sandwich estate between TR 36188 57676 and TR 36231 57696. Each year these are mown off despite requests to leave them. (3) 256 rosettes counted and at least as many seedlings on grass verge in Kings Avenue on Sandwich Bay estate TR 3618 5767. Sadly these will all shortly be mown. (4) A single pale flowered specimen

					at TR 3624 5755 in a private field on the Sandwich Bay estate. (5) c. 200 rosettes on roadside verge at TR 36213 57686, King's Avenue, later mown off before flowering. (6) TR 36049 57578, 17 plants on lawn in Sandwich Bay estate. (7) Verge and gardens in King's Avenue, Sandwich Bay estate.
Sandwich Bay	TR3658	SSSI	(1) 23 May 2022 (2) 6 June 2015 (3) 26 June 2013 (4) 3 June 2010	(1) KBRG meeting (2) DS (3) SB (4) GK	(1) By public footpath across St Georges and just beginning to flower. (2) TR 36105 58224, etc., over 200 plants at known site, along beach to end car park and on house lawns by beach approach road. (3) KWT count of plants on coastal stretch of dunes from new hotel to Sandwich estate - 900 plants. (4) Present.
St Margarets Bay	TR3745		(1) 3 June2010 (2) 23 June 2007	(1) DJ (2) BL	(1) Dover Patrol Memorial, TR 373 452, one sturdy plant, spike emerging, in cage. (2) TR 37353 45249, one non-flowering plant in cage by monument.
Walmer	TR3750		1 June 2012	KBRG meeting	Two plants in grassland behind beach at TR 37834 50034.
St Augustine's monastery, Ramsgate	TR3764		2007	DK	TR 376 643, more than 100 rosettes.
Broadstairs, Northwood east	TR3767		22 July 2024	AL & MK	TR 3707 6762, Millennium Way, Broadstairs.
East Cliftonville	TR3870		18 January 2015	GK & SK	TR 382 702, a large rosette, one smaller and at least three seedlings, in private lawn (formerly grassland of field), where it has flowered in recent years.
Foreness Point	TR3871		(1) 26 June 2024 (2) 29 April 2024	(1) KBRG meeting (2) SC & ML	(1) Present. (2) 31 plants around TR 387 713, plus 13 around TR 385 715.
Kingsgate – North Foreland	TR3970	Local Wildlife Site	13 May 2024	SC & ML	Kingsgate golf course Eight spikes around TR 39741 70234, one at TR 39812 70121.
Botany Bay	TR3971		1 July 2023	KFC meeting (CW)	Botany Bay - Cliff top grassland
North Foreland	TR4069	SSSI	(1) 26 June 2024 (2) 29 June 2015 (3) 5 July 2013 (4) 25 June 2012 (5) 5 June 2012 (6) 1996	(1) KBRG meeting (2) & (3) DJ (4) CO (5) SB (6) FB	(1) frequent in good quality cliff-top grassland from (north) TR 401 698 to (south) TR 401 691, including 16 plants in (probably sown) *Trifolium pratense* at TR 4016 6980, 7 at TR 4015 6977 plus 6 more a little further south, uncounted opposite Cliff House c. TR 4016 6970, 8 at TR 40146 69650, 11 at TR 40154 69608 including at very edge of cliff, 11 more at TR 40151 69620, 11 more at TR 40111 69137. Total in excess of 70, but not comprehensively surveyed. (2) TR 402 698 to TR 401 690, 106 plants in flower, having spread c.50,m towards Joss Bay from where recorder had last seen, in 2013. Plants were very scorched and dried-up, presumably reflecting dry weather in late May and June, as reported also from Sandwich Bay (but contrasting with inland colony at Boxley where presumably weather conditions differed).

					(3) Known colony, est. at least since 1996. TR 402 697 to 401 690, recorder did a count from the pathways and noted 116 flowering plants. Probably capable of being exceeded, but already a record count. Recorder considers this must now be the third best site in Britain after Sandwich and Newmarket Race Course. (4) On chalk grassland at cliff edge: KWT roadside nature reserve, 17 flowering spikes. (5) Two plants at TQ401 692, chalk grassland at very edge of cliff; also 9 or more spikes in bud at TR 40155 69743 in cliff top chalk grassland. (6) Two plants.

Hippophae rhamnoides L. (Sea-buckthorn)

vc 15 and 16

Rarity / scarcity status

Hippophae rhamnoides is widespread in the British Isles and is often planted as an amenity species, particularly by the coast. Its conservation status in England and Great Britain is one of 'Least Concern' as regards risk to its survival. Indeed, it is regarded in the British Isles as having potential to be invasive, to the detriment of other flora, for example where planted to stabilise sand-dunes. There is therefore a degree of incongruity in including this species in the county rare plant register, the criteria for which would normally be expected to result in the selection of plants which have a degree of 'worthiness' in being native (or ancient introductions) and under threat. The inclusion of Sea-buckthorn is in consequence of its being **nationally scarce** as a native. Whilst it is actually quite common in the British Isles, the only populations considered native are along the east coast from close to the Scottish border down to Dungeness / Camber Sands. The species was an abundant coloniser in late glacial times (and, indeed, is known on the Continent as a sub-alpine shrub); but, being shade-intolerant, it was out-competed by the spread of forests and so retreated to open coastal habitats. In Kent, even ignoring inland introductions, it is neither rare nor scarce.

Seasalter. Photo by Lliam Rooney, 9 October 2010

Account

The first evidence of Sea-buckthorn in Kent appears to be a single pollen grain, presumably emanating from a coastal site, but extracted from a block of peat dating between 530 and 1020 BC excavated at the inland Seabrook valley near Folkestone in 1958[303]. The first conventional published botanical reference for Kent (and, indeed, the British Isles) was by Christopher Merrett, who referred to it as 'betwixt *Sandwich* and *Deal*' in his *Pinax rerum naturalium Britannicarum* (1666). However, this was preceded by a manuscript noted by William Mount as having found it by the seaside under the cliffs between Dover and Folkestone in 1582 ('This Rhamnus I founde between Douer and Foulkestone by the sea syde under the Clyffes, a°. 1582, with reddish beries Orange colored') '[304]. Early records are worth noting as they are most likely to be of native, unplanted occurrences, although Frederick Hanbury remarked on planted Sea-buckthorn near Faversham (Hanbury & Marshall, 1899). The species was recorded[305] in a saltmarsh two miles from Sheerness (1746, perhaps Rushenden?); Deal (from at least 1829 onwards; 19th century herbarium specimens refer to Deal sandhills, and this may be Merrett's locality as well); Walmer (before 1899); west of St Margaret's Bay (1802); Lydden Spout, on chalk (1829); Dover (1882); Folkestone cliffs (1849; this may be the same as Folkestone Warren); Folkestone Warren (1876; an 1895 specimen is annotated as on cliffs and landslips by the sea); below Folkestone church, on the greensand (1829); between Folkestone and Sandgate (1801); New Romney, sandhills (1875). Sea-buckthorn's predilection for open coastal habitats seems to override any particularity as regards soil, these records relating to saltmarsh, sand, chalk and Gault Clay.

Most of these locations have demonstrated continuity, for example with Francis Rose having collected from sandy cliffs at Folkestone Leas in 1945 and sand-dunes at Sandwich Bay in 1946 (specimens in **MNE**) and with records made to date. In the county survey of 1971-80 (Philp, 1982), the species was located in 18 tetrads, on fixed sand-dunes and in waste places, usually near the coast. In addition to the presumed native sites, it was regarded as almost certainly introduced or bird-sown in some localities. By 1990-2005 (Philp, 2010), its extent had expanded to 23 tetrads, being noted as occasionally planted as an amenity shrub inland, becoming established and reproducing itself on roadside verges or waste land. The position as regards 2010-24 data is not dissimilar, although coverage has extended to 62 tetrads (88 3 monads). The position at monad resolution is depicted below; all records away from the east, south and north-east coasts are likely to be introduced, escaped or spreading from such origins

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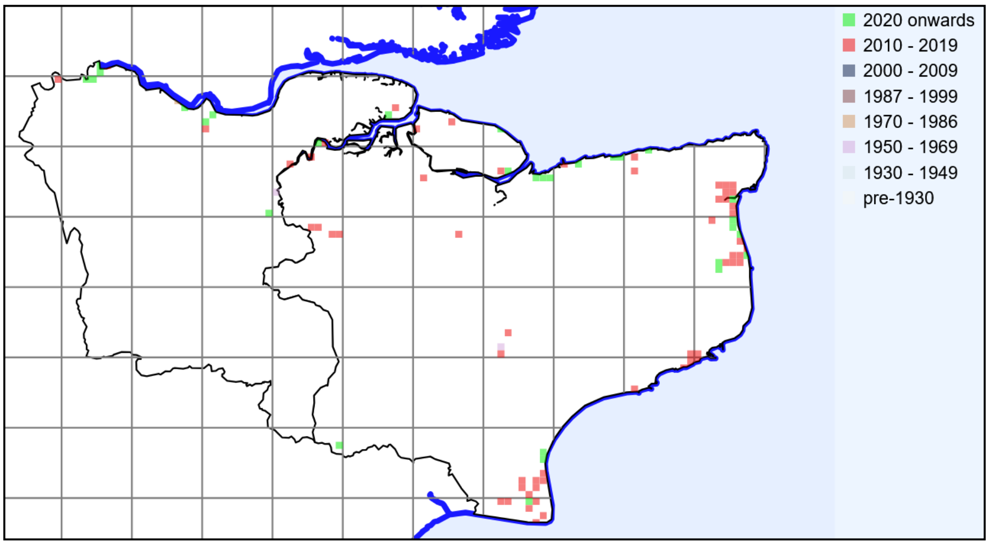
[303] H. Godwin (1962). Vegetational History of the Chalk Downs as seen at Wingham and Frogholt. *Veröffentlichungen des Geobotanischen Institutes der Eidg. Tech.*, Hochschule, Stiftung Rübel, in Zürich **37**: 83-99.

[304] R.T. Gunther (1922*). Early British Botanists and their Gardens*. Oxford University Press, Oxford.

[305] The following list derives from a variety of sources, including E.W. Groves (1958). Hippophae rhamnoides in the British Isles. *Proceedings of the Botanical Society of the British Isles* **3**: 1-21. Groves provided an early assessment of native status.



***Hippophae rhamnoides* Kent records to 2024 mapped at monad level, from BSBI database**

Eastern Quarry, Bean, inland chalk habitat. Photo by David Steere, 26 August 2019

Reasons for planting may vary. The species demonstrates attractive silver-bronze foliage and, where male and female plants are grown together, orange berries (supposedly with health benefits). The male plants are also attractive in winter, with clusters of bronze-metallic buds. In Britain, there have been plantings for sand-dune stabilisation, which also provides food and shelter for birds. There is a balance to be struck here, however, given that sand-dune growth may also be invasive beyond what may serve the purposes of stabilisation, supposing that it is desirable to arrest change in a mobile dune system.

At Greatstone dunes, Sea-buckthorn has been present at least since 1947 (when noted as abundant by E.C. Wallace, specimen in **BM**). It is not clear whether this is the same location as the pre-1899 New Romney record, but the plant appears to act as stabilisation coastwards of residential development started from the 1920s, adjoining the narrow strip of the Greatstone Dunes. The narrowness of the dunes, however, places their diversity at risk from dominant Sea-buckthorn expansion, and from 2011-12 onwards, following earlier infestation by Brown-tail moth caterpillars (whose food plant is Sea-buckthorn), work was undertaken by Shepway District Council and Romney Marsh Countryside Partnership to remove 85% of the bushes. Another location where invasion has been considered an issue is at Sandwich / Pegwell Bay, where the Hippophae Study Group in 1972[306] considered that there was a high risk of invasion and it was recommended that seedlings be uprooted and growth cut back in selected areas, with selected growths allowed to mature.

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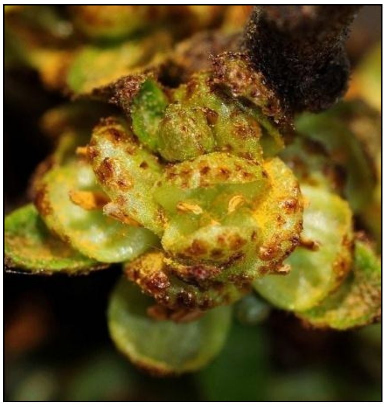
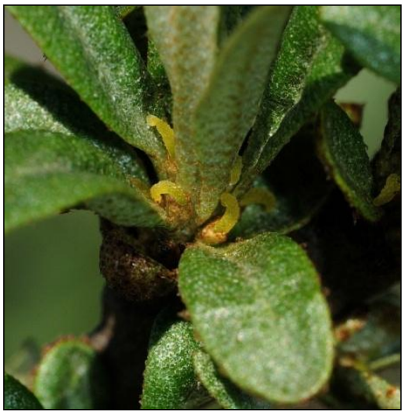
[306] D.S. Ranwell (ed.) (1972). *The management of Sea Buckthorn Hippophaë rhamnoides L. on selected sites in Great Britain* (report). The Nature Conservancy.



Male flowers

Female flowers

Seasalter. Photos by Lliam Rooney,
8 April 2011



Samphire Hoe. Photo by Lliam Rooney, 19 May 2010

Dungeness, habitat. Photo by Heather Silk, 6 April 2014

Hippophae rhamnoides dune scrub is a recognised plant community (SD18)[307], although where the species is dominant through its vigorous suckering from horizontal root growth producing thick thorny bushes, little else will grow. Fixation of atmospheric nitrogen by root nodules may lead to a marginal nitrophilous flora, e.g. *Urtica dioica* (Common Nettle), *Galium aparine* (Cleavers) and *Arrhenatherum elatius* (False Oat-Grass). Where it is not dominant, the flora tends to relate to what was there before invasion. Pearson & Rogers (1962)[308] give a list of associates for the (relatively unusual) habitat of Gault Clay, on which a small thicket of Sea-buckthorn was growing at the East Cliff Folkestone. These included *Equisetum arvense* (Field Horsetail) and *Tussilago farfara* (Colt's-foot), which might be expected on the damp mobile clay; but also some plants indicating the nearby presence of chalk - *Poterium sanguisorba* (Salad Burnet) and *Carlina vulgaris* (Carline Thistle).

Hippophae rhamnoides is a distinctive shrub, not readily confusable with any other species.

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[307] This is also equivalent to the European Habitat Directive (designation of priority habitats for conservation) H2160 ‘dunes with *Hippophae rhamnoides’* habitat.

[308] M.C. Pearson & J.A. Rogers (1962). *Hippophae rhamnoides* L. (Biological Flora of the British Isles). *Journal of Ecology* **50**: 501-513.

Hordeum marinum Huds. (Sea Barley)

vc 15 and 16

Rarity / scarcity status

Hordeum marinum is an annual grass of southern England and Wales, generally confined to coastal areas, especially along the Essex coast, the north Kent coast and Severn estuary, but also present by inland roads treated with de-icing salt. It is regarded as **Vulnerable** to the risk of extinction in the wild, both in England and in Great Britain as a whole. Its vulnerability is indicated by a comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999, which produced a calculated decline of 40%, in the likelihood of recording the species. This is attributed to habitat changes: the rebuilding of sea defences, infilling of pools and ditches and the cessation of grazing, with or without conversion of the grazing land to arable. It is a species of principal importance under s.41 Natural Environment and Rural Communities Act 2006. It is **nationally scarce** and the Kent and Essex populations are significant in a national context, even though in Kent it is neither rare nor scarce, largely concentrated on land adjoining the Thames and Swale estuaries. It is a Kent axiophyte, and so is an indicator of good habitat.

Shellness Hamlet, Sheppey. Photo by Lliam Rooney, 22 August 2011

Account

According to Hanbury & Marshall (1899), the first Kent notice of Sea Barley is given by Dawson Turner and Lewis Dillwyn in their *Botanist's Guide through England and Wales* (1805), in which they refer to the species as found at 'Salt marshes at Seabrook, near Hithe', on the authority of Mr Joseph Woods, junior. It is perhaps a little surprising that this ostensible first sighting was in the south east of the county, where there have been relatively few records since, instead of the north coast of Kent between Gravesend and the eastern mouth of the Swale where it is currently centred. However, the 1805 record is preceded by one made by Pehr Kalm, a pupil of Linnaeus, in 1748 at Gravesend in his diary, the relevant part of which was not translated into English until 2013[309]. There are other somewhat later historic records away from what we would now regard as the main distribution area: Matthew Cowell, in his *Floral Guide for East Kent* (1839), refers to records at the sandhills between Deal and Sandwich (Miss Hervey) and at the salt pans between Sandwich and Pegwell. Hanbury & Marshall (1899) refer to the species as frequent in pastures, on banks and waste ground near the sea and tidal rivers, extending up the Thames to Greenwich and the Medway nearly to Burham; this reference provides a clearer indication of the importance of north Kent coastal areas

Rushenden, Sheppey, trackside habitat. Photo by Geoffrey Kitchener, 21 August 2012

Philp (1982) regarded Sea Barley as fairly common along the north Kent coast between Gravesend and Whitstable, but scarce elsewhere. A couple of new habitats had emerged inland: an orchard where wool-shoddy had been used[310], and the edge of the M20[311] together with other halophyte species. It was seen in 60 tetrads, whereas during the subsequent 1991-2005 survey published as Philp (2010), only 48 tetrad records were made, which gives some support for the national picture of decline. It was then described as growing on bare vegetated patches on sea walls and coastal tracks and on trampled margins of dried up coastal pools and ditches; no inland habitats were noted. Such inland habitats, however, do figure in 2010-24 data, as Sea Barley has been seen during that period alongside the A249 for several kilometres southwards from the Sheppey Crossing, and also scattered alongside the A2070 (Ashford to Brenzett road), and at the M25/A2 junction, in each case colonising semi-bare habitats subject to saline influence.

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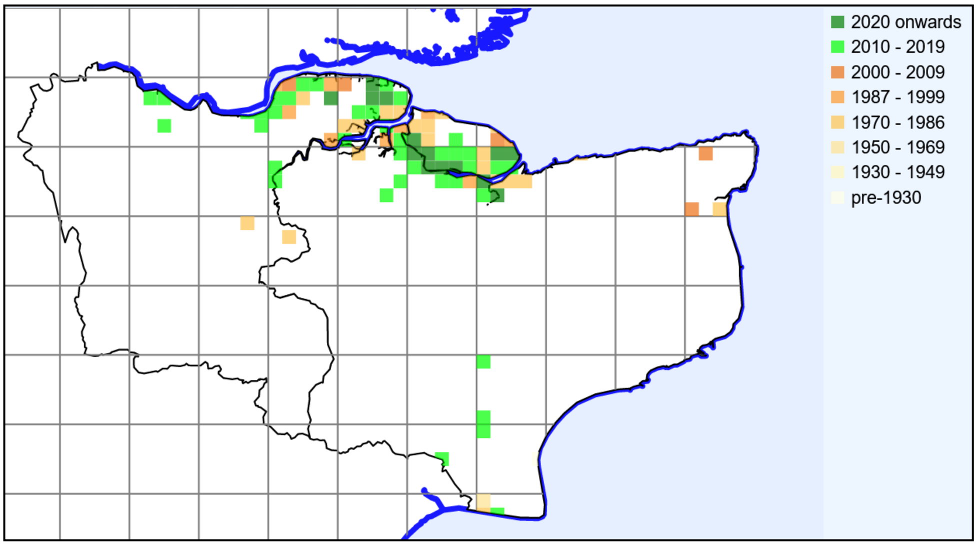
[309] Edgington, J. (2017). Agrarian practices and the flora of London in the eighteenth century. *The London Naturalist* **96**: 54-62.

[310] It is possible that this occurrence was of subsp. *gussoneanum* (Mediterranean Barley), although not named as such; our usual plant being subsp. *marinum*.



***Hordeum marinum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

In comparison with the 48 tetrad records given in Philp (2010), there have been sightings in 2010-24 for 53 tetrads (90 monads). This does not indicate a continuation of decline since the 1991-2005 survey and it may be that more intensive survey of the Hoo peninsula would bring records back to the 1971-80 level of 60 tetrads.

Allhallows. Photo by David Steere, 19 August 2018

Hordeum marinum, as an annual, relies upon the existence of open areas minimizing competition. It is spring-germinating; it is unclear how far autumn-germinating seedlings survive).

Typically in Kent these open areas are patches of ground on London Clay on the landward side of sea walls where through the existence of seepage or depressions, the salinity has prevented growth of perennial vegetation. Presumably, germination follows a temporary reduction in salinity after winter rains; and these areas generally dry out in spring and set hard in summer. Ground kept open by cattle trampling or rutting by vehicles, often around entrances to fields in brackish grazing marshes, also provides typical habitat; and the grass may be found ringing brackish pools, where the mature spikelets will have

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[311] In contrast with abundant *Puccinellia distans* (Reflexed Saltmarsh-grass), only one small colony of *Hordeum marinum* was noted in J. Feltwell & E. Philp (1980). Natural History of the M20 motorway. *Transactions of the Kent Field Club* **8:** 101-114.

A scattering was also seen in the centre reservation of the A2 in 1982 – G.D. Kitchener (1983). Maritime plants on inland roadsides of West Kent. *Transactions of the Kent Field Club* **9**: 87-94.

broken up and have been dispersed along the winter flood-line levels. It may also be found in the spray zone, for example along the south shore of Sheppey lining the Swale where it forms a continuous line for long distances.

Several sites were surveyed in 2010 for the BSBI Threatened Plant Project. There was evidence for the loss of the species where under-grazing had permitted coarse perennial vegetation to invade sea wall slopes and the intervening ground between them and parallel drainage dykes; but there were also management steps being taken to restore heavier grazing. The most frequent associates were: *Agrostis stolonifera* (Creeping Bent), *Elymus athericus* (Sea Couch), *Lolium perenne* (Perennial Rye-grass), *Parapholis strigosa* (Hard-grass), *Plantago coronopus* (Buck's-horn Plantain), *Plantago major* (Greater Plantain) and *Polygonum aviculare* (Knotgrass). Occasionally, other rare plant register species of saltmarsh or brackish grazing marshes were noted in the immediate vicinity: *Carex divisa* (Divided Sedge), *Limbarda (Inula*) *crithmoides* (Golden-samphire), *Puccinellia fasciculata* (Borrer's Saltmarsh-grass) and *Rumex palustris* (Marsh Dock).

Rushenden, Sheppey, pool margin habitat.
Photo by Geoffrey Kitchener, 21 August 2012

Hordeum marinum is not readily confusable with other British species except, perhaps, depauperate *Hordeum murinum* (Wall Barley). However, Sea Barley is a smaller, stiffer species, bluer-green, and with shorter spikelets, the awns being wide-spreading and the glumes of the central spikelet of each triad being scabrid (rather than ciliate).

Hottonia palustris L. (Water-violet)

vc 15 and 16

Rarity / scarcity status

Water-violet grows in shallow ponds and ditches, scattered across England and Wales but with very little presence elsewhere in the British Isles. Hence its conservation risk assessment for Great Britain has been brought into lines with that for England, in which the species is treated as **Vulnerable** to the risk of extinction in the wild. This is a consequence both of a contraction of its range and a diminution in the area of occupation within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 37% and its area of occupancy had declined so that there was a 33% reduction in the likelihood of recording the species. In Kent, there has also been a significant decline, albeit measured over a different period, the number of tetrad records having halved by comparing the 1991-2005 county survey with that of 1971-80. Whilst Water-violet is as yet neither rare nor scarce in Kent (at least, East Kent), the outlook for the species is unpromising. It is a Kent axiophyte, and so is an indicator of good habitat.

Marden Meadow. Photo by Lliam Rooney, 23 May 2013

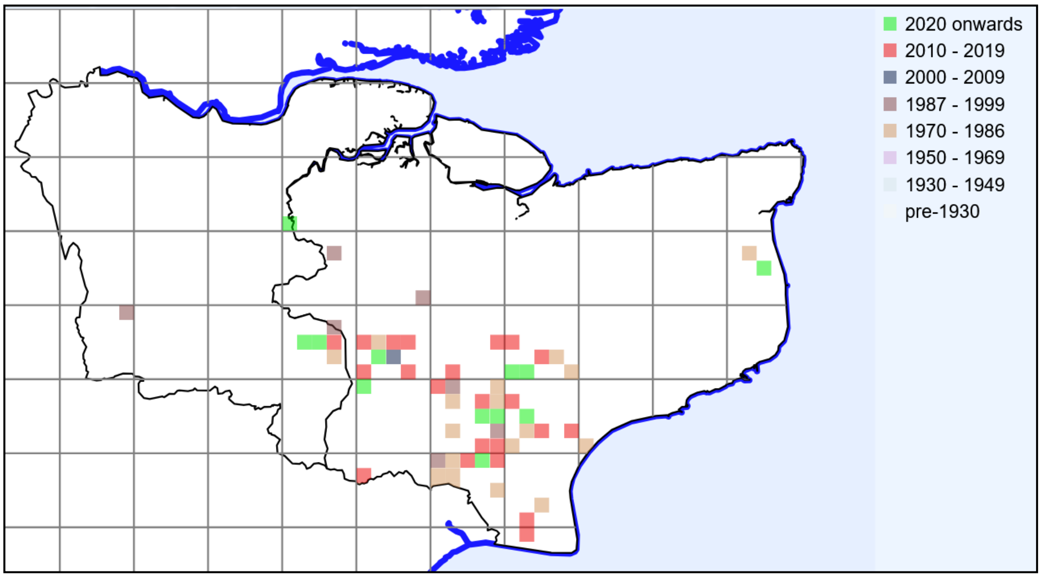
Account

The first Kent record for *Hottonia palustris* was made on 4 August 1632, recounted by Thomas Johnson in his *Descriptio Itineris* (1632) as seen in travelling from Sandwich to Canterbury, apparently in the dykes with other aquatics before reaching Ash. Hanbury & Marshall (1899) considered the species to be locally common in ditches and ponds, citing many historical records from all botanical districts except in north Kent from the current London boundary to Rochester and thence along the chalk to Wye (this chalk area is deficient in ponds). There are occasional comments remarking on its abundance: one or other of the authors had seen it as abundant in Ham and Deal marshes; and W.R. Jeffrey of Ashford, a contributor to the 1899 Flora, had reported it as common in ponds all around Ashford. Francis Rose noted it as a native of ponds and marsh ditches; still locally common on the eastern half of the Weald Clay, and Romney Marsh, and on the Gault about Ashford; now (c.1960) rare elsewhere, appearing to be extinct in north west Kent and extremely rare in north east Kent despite many earlier records.

The Dowels, Romney Marsh. Photo by Lliam Rooney, 27 June 2012

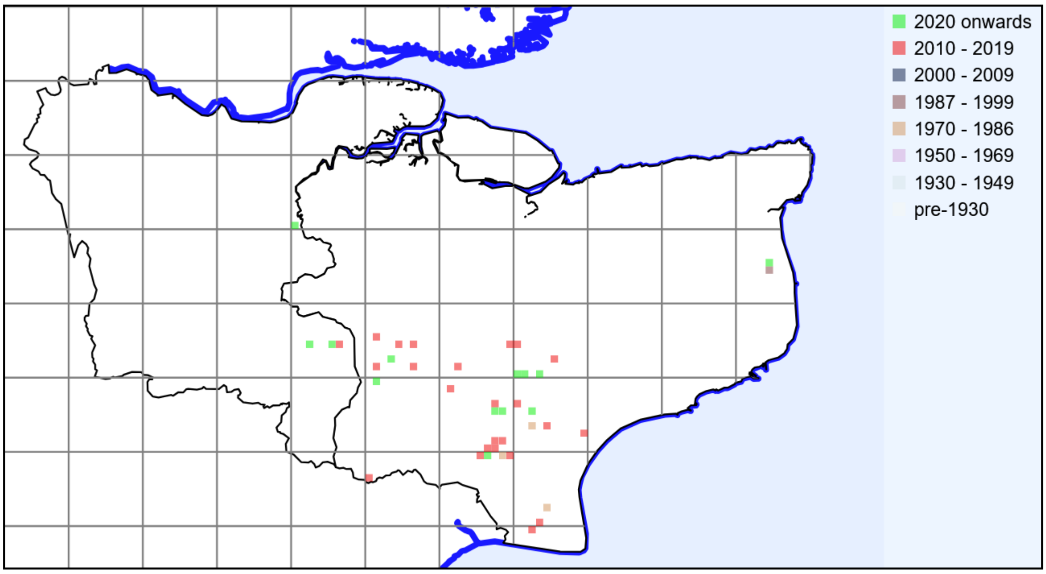
Philp (1982) reported *Hottonia palustris* in 32 tetrads, primarily in the East Kent Weald, extending also down into Romney Marsh. It was then regarded as rather local and declining through loss or destruction of suitable habitats. Those 32 tetrads were reduced to 16 in Philp (2010), in which the slow decline was expressed to be continuing, for the same reasons. The greatest losses appear to have occurred in the Kent part of hectad TQ92, which covers the Rother Levels and the western part of Romney Marsh, where nine tetrads had diminished to one.

Our 2010-23 data for the same hectad, however, has the species in three tetrads. The overall current position is by no means as pessimistic as the 1991-2005 survey indicates, and is little short of the 1971-80 total, with the 2010-24 data covering 34 tetrad records (37 monads). The general distribution area is also fairly similar; but only some of the 2010-21 and 1990-2005 sightings actually coincide, as may be noted from the historic tetrad mapping below. Given the quantity of ditches and ponds in the Weald, this may just be a function of different sampling.



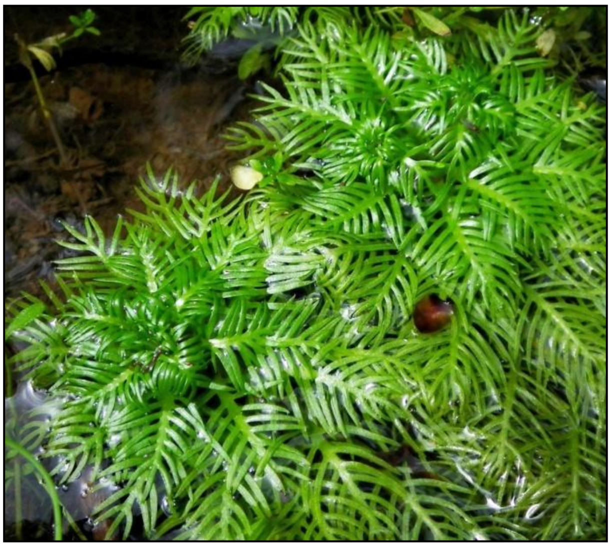
***Hottonia palustris* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Greater definition is given at monad resolution below, although almost all records are for 2010-20 because recording at monad level only became the norm in Kent from 2010.



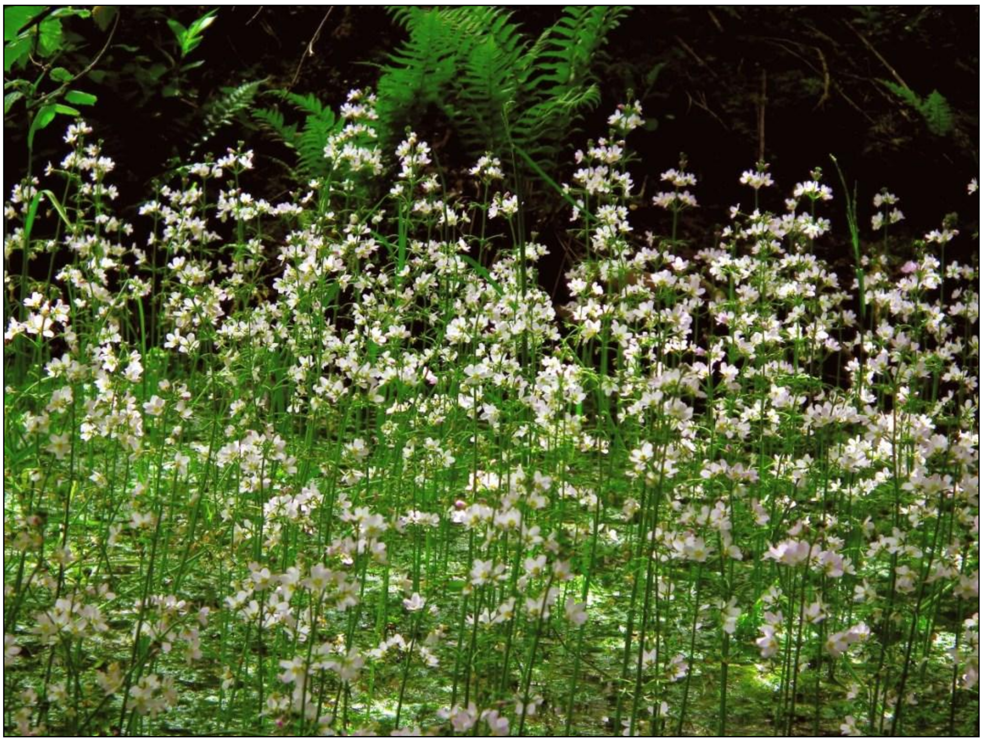
***Hottonia palustris* Kent records to 2024 mapped at monad level, from BSBI database.**

Hottonia palustris is a perennial of still, shallow, clear water which is not eutrophic. It has been said to favour base-rich waters, but in Kent it has been found in waterbodies on a variety of geological formations where waters may be expected to range from base-rich to neutral or slightly acid. Francis Rose collected specimens (in **MNE**) from ponds on Weald Clay (near Headcorn, 1949); on Gault Clay (Nackholt, 1958); on Wadhurst Clay (East Oxney, 1958); on the Lower Greensand (Mersham le Hatch, 1960); and in alluvial marsh dykes (between Appledore Station and Kenardington, 1959) as well as in a peaty fen dyke, presumably with calcareous influence (Worth Minnis, 1956). (His manuscript *Flora of Kent* has a high proportion of records with six-figure grid-references, and it would be possible to trace the range of 1940s-60s occurrences with their related geology more thoroughly.) Our 2010-24 records, found in ponds and ditches also show a range of substrates, and the species was sometimes seen in considerable quantity, e.g. prolific for several hundred metres of dyke at Lydd Ranges in 2014.



The Warren, Ashford. Photo by David Steere, 10 May 2014

The flowers are borne on leafless emergent stalks, but the species is more usually seen and identified in a vegetative state, with its distinctive narrow, pinnate leaves, appearing whorled. There is a 'land form' with smaller, more rigid leaves, which may result from being stranded by changing water levels. Such changes may be beneficial to the species, because falling water levels in late summer offer opportunities for establishment of seedlings on the exposed mud. As well as reproducing by seed, Water-violet can establish from fragments when the flowering stems disintegrate or through dispersal by birds or ditch/pond clearing machinery. Our recent data include no obvious cases of deliberate introduction, but the species is used as for aquascaping by aquarists and so there is potential for release into the wild with other aquarium contents (this may involve foreign material; it is sometimes sold as originating from Asia, although it is primarily a European species with very little presence in western Asia).



The Warren, Ashford. Photo by David Steere, 10 May 2014

Hydrocharis morsus-ranae L. (Frogbit)

vc 15 and 16

Rarity / scarcity status

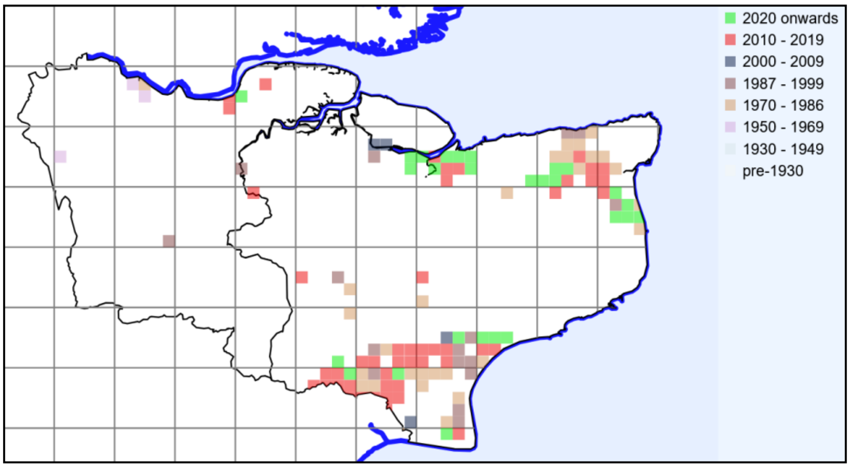
Hydrocharis morsus-ranae is locally frequent in parts of England and Ireland, with a scattering in Wales. It is treated as **Vulnerable** to the risk of extinction in the wild, in both Great Britain as a whole and in England. Its vulnerability is indicated by a comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999, which produced a calculated decline of 46%, in the likelihood of recording the species. There is some evidence of decline in Kent with changes in habitat, with the number of tetrad records having fallen by 12% between the county surveys of 1971-80 and 1991-2005. However, Frogbit is neither rare nor scarce in Kent. It is a Kent axiophyte, and so is an indicator of good habitat.

Brook Bridge, Graveney. Photo by Lliam Rooney, 17 July 2010

Account

The first Kent record of Frogbit was made, as with the preceding register account (for *Hottonia palustris*), by Thomas Johnson in 1632, in the marsh dykes west of Sandwich. Hanbury & Marshall (1899) regarded the species as common, present in ditches, pools and slow streams in all the botanical districts of the county, especially in marsh-dykes near the sea and tidal rivers. They did not enumerate any records, but it was evidently present in areas away from its current distribution, e.g. in the south west of the county Thomas Forster regarded it as not uncommon in ditches and slow running rivers (*Flora Tonbrigensis*, 1816). More recent records in the Weald are decidedly uncommon: there is the occasional tetrad marked in Philp (1982) and Philp (2010). Francis Rose considered it to be locally frequent to locally common in alkaline fresh waters of marsh dikes and ponds in the Stour catchment from Stodmarsh eastwards, in the Beult basin and at Romney Marsh.

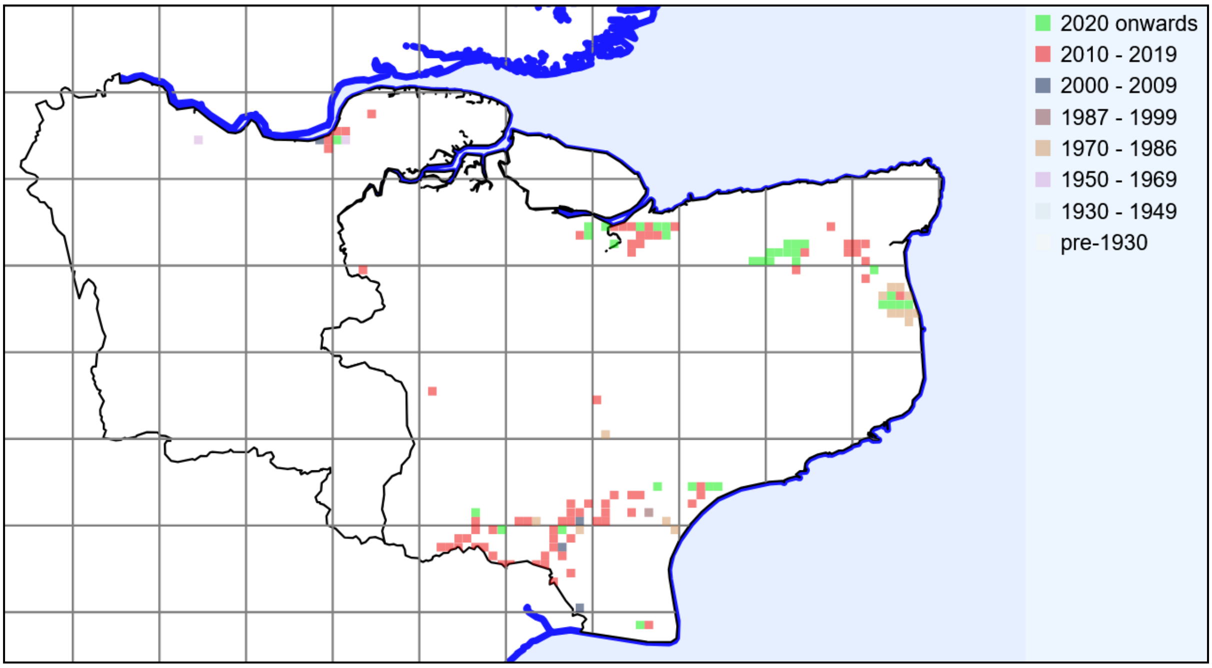
By the 1971-80 county survey, the species was largely restricted to three areas in Kent: Romney Marsh (especially the inland parts, including the levels around the Isle of Oxney); the Seasalter Levels to Oare Marshes (with an outlier further west along the Swale); and from Deal/Worth/Sandwich across the low land (the former Wantsum Channel) around Thanet and up the Stour valley. It was regarded as rather local, but often quite common where it did occur. The 89 tetrads recorded, however, had reduced to 60 in Philp (2010) and it was noted that Frogbit had been lost from some sites where adjoining grazing fields had been turned into arable. This is particularly relevant to losses at Romney Marsh, considered further below and where a quarter of the records had gone between the surveys of Philp (1982) and Philp (2010); and there had also been substantial losses in the area inland of Thanet.



***Hydrocharis morsus-ranae* Kent records to 2024 mapped at tetrad level, from BSBI database.**

In comparison with the 60 tetrad records from 1991-2005, recording in 2010-24 has identified the presence of Frogbit in 74 tetrads (109 monads). The results do not provide evidence of further decline since 1991-2005, although they do affirm a decline after1971-80. Search in 2010-24 has clearly been more successful than Philp (2010) in the Seasalter area (but not the Swale outlier) and around Higham Marshes.

Greater definition is given at monad resolution below, but although recording at monad level only became the norm in Kent from 2010, there are a number of earlier records deriving from intensive ditch/dike surveys in 1982. It is possible that some could be re-found if similar intensity of survey is repeated now, although there are issues about habitat change in Romney Marsh discussed below.



***Hydrocharis morsus-ranae* Kent records to 2024 mapped at monad level, from BSBI database.**

Frogbit at Romney Marsh was studied by Mountford & Sheail (1989)[312], who found that it could be treated as an indicator species of the effects of change from pastoral to arable use. The tithe commutation survey maps of 1837-44 showed 88% of Romney Marsh agricultural land as pasture or meadow, and even by the first Land Use Survey of the early 1930s over 90% of the Marsh was described as grassland. The removal of many sheep in the 1940s coupled with the wartime need to increase arable production resulted in the proportion of arable rising from 9% to 37%. A further change occurred in the 1960s as a result of drainage schemes, which made arable cultivation more feasible, the amount of permanent grassland declining from 43% to 31% between 1965 and 1969.

These changes continued into the 1980s, when Mountford & Sheail were carrying out their Romney Marsh fieldwork, and have had adverse consequences for the habitat favoured by Frogbit, in a number of ways. After conversion to arable, some ditches may be infilled to make it easier to move farm machinery. Small shallow ditches may become redundant and dry out through under-drainage schemes and the deepening of main drains. The cessation of grazing removes a means of keeping ditch margins open without invasion of coarse, tall vegetation; and if replaced by heavy ditch clearance operations with ditches being enlarged and banks steepened (or alternatively, ditch management ceases altogether and vegetation succession takes place), the effect is to reduce the number of plant species, including Frogbit. In an arable landscape with few large, open drains and the smaller ditches either overgrown or eliminated, Frogbit may only survive in marginal areas of drains where machinery cannot reach.

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[312] J.O. Mountford & J. Sheail (1989). *The effects of agricultural land use change on the flora of three grazing marsh areas*. NCC.

These changes may be reflected in some of the 1970-86 squares in the distribution map taken from BSBI database tetrad records above. The absence of records since for much of the low ground around Birchington, St Nicholas at Wade and Sarre may represent under-recording or also reflect conversion from grazing to arable.

Hydrocharis morsus-ranae prefers shallow, still, unshaded water. Its needs are best met by small pasture ditches less than one metre deep, where livestock suppress marginal growth and where management work is not radical. It does not cope with ditches which dry out; with ditches dominated by reed or the like; or with large expanses of open water subject to strong wind or water movement. It often grows with other floating species, including *Lemna gibba* (Fat Duckweed), *Lemna minor* (Common Duckweed) and *Spirodela polyrhiza* (Greater Duckweed). These, and *Berula erecta* (Lesser Water-parsnip), *Glyceria fluitans* (Floating Sweet-grass), *Lemna trisulca* (Ivy-leaved Duckweed) and, more rarely, *Wolffia arrhiza* (Rootless Duckweed)[313], are a recognized plant community, the *Spirodela polyrhiza - Hydrocharis morsus-ranae* community (A3). The accompanying photograph of habitat at the Dowells shares some characteristics of that community, with *Wolffia* present, although much of the surface duckweed was *Lemna minuta* (Least Duckweed). *Hydrocharis morsus-ranae* normally, if not almost invariably, spreads vegetatively, with new plants developing as buds at the end of floating stolons, over-wintering and then germinating in spring.

The Dowels, habitat. Photo by Geoffrey Kitchener, 27 June 2012

Hydrocharis morsus-ranae is not readily confusable with any other British species except, perhaps, non-flowering *Nymphoides peltata* (Fringed Water-lily), which favours somewhat deeper, more open water and which generally has larger leaves and is rooted in the substrate rather than being fully floating.

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[313] *Wolffia columbiana* (Columbian Watermeal) may be involved instead, or in addition.

Hyoscyamus niger L. (Henbane)

vc 15 and 16

Rarity / scarcity status

Hyoscyamus niger is an archaeophyte, or ancient introduction, scattered through lowland areas of the British Isles. It is considered to be **Vulnerable** to the risk of extinction in the wild, both in England and in Great Britain as a whole. In England, this is a consequence both of a contraction of its range and a diminution in the area of occupation within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 46% and its area of occupancy had declined so that there was a 39% reduction in the likelihood of recording the species. In Kent, there has apparently been an even steeper decline, albeit measured over a different period, Henbane tetrad records having fallen by 71% between 1971-80 and 1991-2005. On the basis of Philp (2010), it would be regarded as being scarce in the county, but in view of records made since, it is not quite so uncommon.

Lullingstone. Photo by Sue Buckingham, 16 June 2009

Account

Henbane seeds have been found in a Neolithic / Early Bronze Age pit at Willesborough, Ashford, excavated in 2001[314], as part of what appeared to be waste disposal of burnt hearth residues and possibly other plant material. Charred cereal grains, weed seeds associated with cultivation or human disturbance and, significantly, *Chenopodium album* (Fat-hen), *Sambucus nigra* (Elder) and *Urtica dioica* (Common Nettle) were also present. These last species, with Henbane, are associated with nitrogenous ground affected by human activity, such as middens, which gives further context for this early Kent occurrence.

There has been a comparable find[315] in a late Roman context, in the fill from a well at Thurnham Roman Villa where, with charred cereal grains and weed seeds and waterlogged remains of *Hyoscyamus niger, Chenopodium* sp. (a Goosefoot), *Sambucus nigra* and *Urtica dioica*, a similar pattern of crop-processing activities and the presence of disturbed, nutrient-rich ground is indicated. Seeds were also found in an early to middle Iron Age context in a pit at White Horse Stone where they accounted for between 25% and 45% of all weed seeds in the relevant samples; it was thought that they had just been burnt along with other crop-processing waste, rather than having been gathered because of the plant's medicinal properties.[316] Late Bronze Age material yielded seeds from investigations relating to the CTRL construction of Saltwood tunnel, together in a pit with the remains of a broad bean crop.[317]

The first Kent botanical record is by Thomas Johnson: it was one of the plants first listed by him as encountered on travelling from Gravesend, after dinner on 13 July 1629, by the main road to Rochester (*Iter*

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[314] Report by A. Davis, in E. Eastbury & L. Blackmore (undated). *Excavations at Boys Hall Road, Willesborough, Ashford*. Museum of London.

[315] Giorgi, J. (2006). *The waterlogged plant remains from well 11010 at Thurnham Roman Villa, Kent* (ARC THM 98) (CTRL Specialist Archive Report, provided by Archaeology Data Service).

[316] Giorgi, J. (2006) The plant remains from White Horse Stone, Pilgrim's Way and Boarley Farm, Aylesford and Boxley, Kent. CTRL Specialist Report. London and Continental Railways.

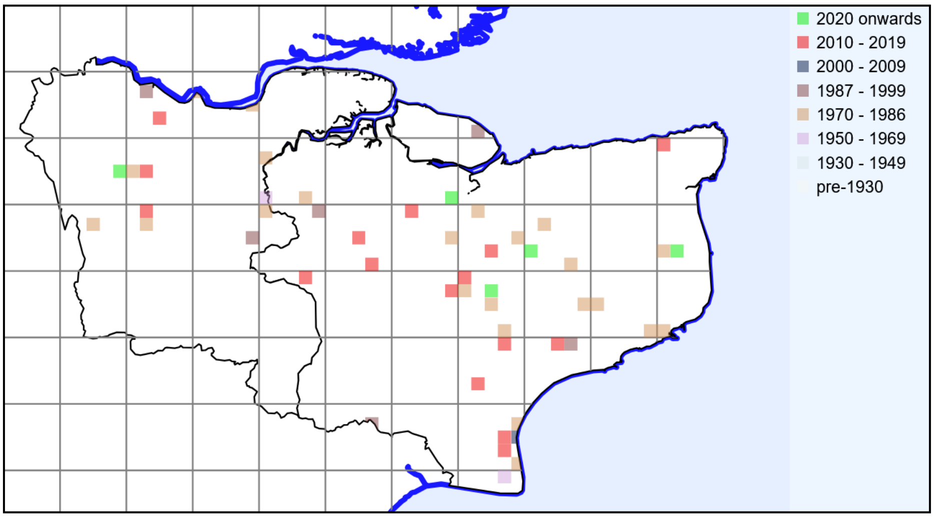
[317] Stevens, C. (2006). The charred plant remains from Saltwood Tunnel, Kent. CTRL Specialist Report. London and Continental Railways.

Plantarum, 1629). As an apothecary, he would have been interested in the medicinal aspects of this species, dealt with by the early herbalists, including John Gerard, whose *Herball* was re-issued edited by Johnson in 1633 (this edition carries forward Gerard's description, not confined to Kent, of the plant as growing 'almost every where by highways, in the borders of fields about dunghills and untoiled places'). Other early Kent records include Edward Jacob's mention of it as '*By Road sides near the* Town [Faversham] – *common*' (*Plantae Favershamienses*, 1777); Milne & Gordon's reference to the species as on dunghills about Brockley (*Indigenous Botany*, 1793); and Thomas Forster's record of the plant growing on rubbish at Summer Hill [Somerhill] House, Tonbridge (*Flora Tonbrigensis*, 1816). Hanbury & Marshall (1899) regarded it as often only sporadic, but frequent on banks and in bushy places on chalk, also near the sea. Their listings include many sites on chalk, but also gravel (at Dartford Common and near Sandwich) and on sand (Tunbridge Wells Common) and presumably shingle (Dungeness and beaches near Dover and between Whitstable and Seasalter).

Littlestone, sand/shingle habitat. Photo by Owen Leyshon, 9 October 2012

Philp (1982) regarded *Hyoscyamus niger* as rather local and erratic in its appearance, being found on well-manured fields, on chalky banks and on disturbed waste ground, particularly where there are rabbit warrens. The total of 28 tetrad records found in the 1971-80 survey, however, reduced to eight tetrads for 1991-2005 (Philp, 2010). This was attributed to being probably due to more efficient farming practices. The habitats where it was encountered remained similar, but included also coastal sandhills (as had some of the 19th century records).

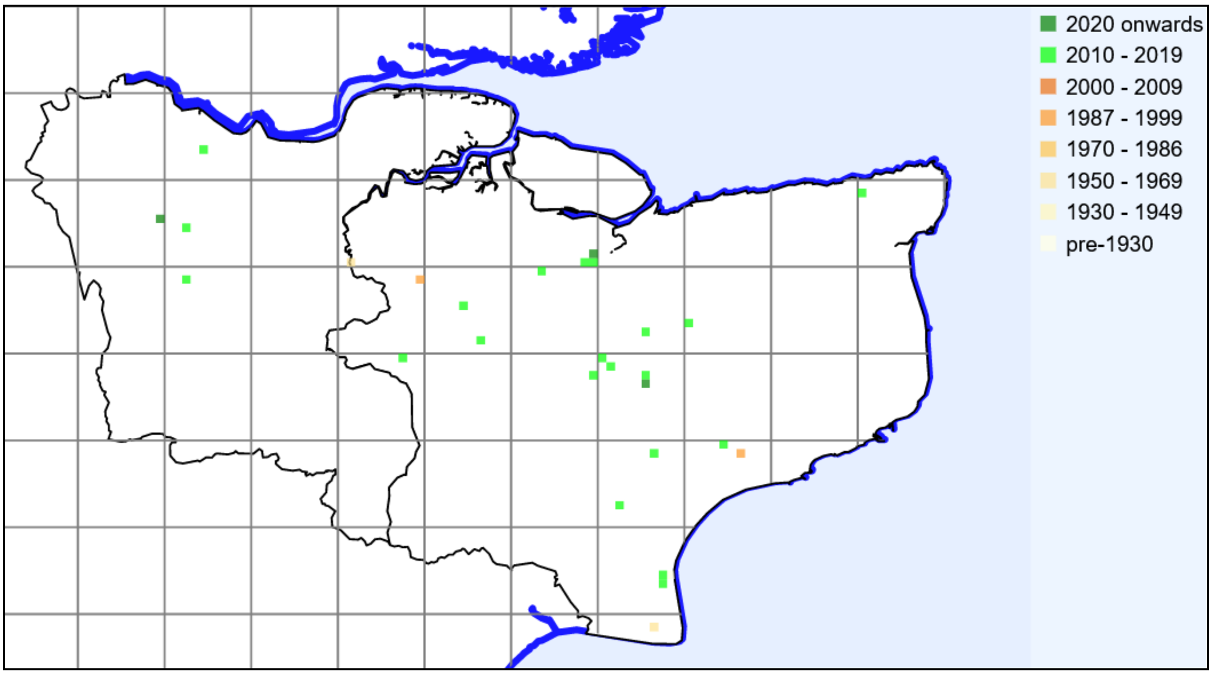
The 2010-24 data have far exceeded the Philp (2010) records – with 21 tetrads (25 monads). Only three of these appear to represent Philp (2010) locations: a rabbited chalk slope at Hollingbourne; a field margin at Westwell; and sandy/shingly disturbed ground at Littlestone. On the other hand, none of the tetrad records in Philp (1982) is repeated in Philp (2010), which accords with the species' reputation for turning up unexpectedly and then disappearing. This 'come and go' characteristic is combined with degree of randomness, as will be seen from the tetrad resolution map below.



***Hyoscyamus niger* Kent records to 2024 mapped at tetrad level, from BSBI database.**

When viewed at monad resolution as below (with the result that most records are relatively recent, as monad recording only became the norm in Kent from 2010), there is not a great deal more information because of the limited clustering of records. The absence of clustering, i.e. there are few monad records sufficiently close to each other that they fall within one tetrad, emphasises the randomness of spread.

***Hyoscyamus niger* Kent records to 2024 mapped at monad level, from BSBI database.**



However, despite the generally sporadic nature of the species' occurrence, some of our sites have considerable continuity: for example, although the sighting by Alfred Gay of six rosettes at Postling Downs in 2011 was his first since 2005, Francis Rose had found it here in 1946, abundant on the chalk slopes by rabbit burrows. Also, our record on a chalk slope in Lullingstone Park in 2011 near rabbit diggings probably corresponds to that by W.H. Griffin in 1905, when the species was seen well established on a chalk slope in the park (*Woolwich Surveys*, 1909)[318]. This pattern of behaviour would be consistent with erratic germination[319] of seeds with long-term viability.

Boughton Monchelsea deer park, by church. Photo by Brian Gomm, July 2005.

The association with rabbits (also applicable to the Boughton Monchelsea site illustrated below, where seen by Brian Gomm at least from 2005 to 2016) appears to reflect the species' preferences for disturbed, well-drained ground and the absence of competition (by virtue of soil disturbance and of rabbits apparently grazing other plants instead, presumably as a result of Henbane's toxic properties) required for re-establishment, Henbane being normally a biennial, although there is an annual form. There may also be a relationship with nitrogen soil content from rabbit droppings, given the historic records for dunghills. Nitrogenous soil content may be contributed by other animals, as with a 2022 find north of Chelsfield, in a heavily horse-grazed field. However, a material proportion of our recent records have been from arable land, and agricultural operations are likely to lead to less continuity of occurrence in any event.

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[318] This is not the only site in Lullingstone Park. It has also been recorded at a knoll south of the golf course (e.g. in 1995).

[319] Germination appears to be affected by double dormancy and a partial requirement for darkness – C.Çirak, K. Kevseroğlu & B. Sağlam (2004). Physical and Physiological Dormancy in Black Henbane (*Hyoscyamus niger* L.) Seeds. *Journal of Plant Biology* **47**: 391-395. Seed viability may extend up to 650 years - S. Odum (1965). Germination of ancient seed. *Dansk Botanisk Arkiv* **23**: 1-70.

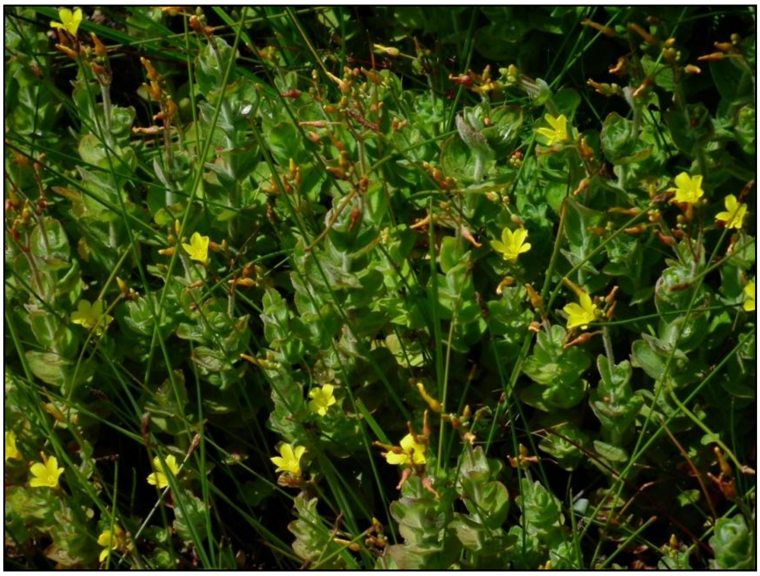
Hyoscyamus niger is not readily confusable; there are other species of *Hyoscyamus* which have rarely occurred as casuals in the British Isles, but not, it seems, in Kent.

Hypericum elodes L. (Marsh St John's-wort)

vc 15 and 16

Rarity / scarcity status

Marsh St John's-wort is locally frequent in south and west Britain and in Ireland, where suitable bog habitat is available. Its conservation status in Great Britain as a whole is of 'Least Concern'. However, in England it has been assessed as **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 24% in the likelihood of recording the species. In Kent, there is now very little suitable habitat, and it is **rare**. It is a Kent axiophyte, and so is an indicator of good habitat.



Hothfield. Photo by David Steere, 6 July 2014

Account

The first Kent record is to be found in John Ray's *Synopsis Methodica Stirpium Britannicarum* (1724, the third edition, edited by Dillenius), 'In the little Bog near *Charlton*'[320]. Early records are limited in the main to four areas: the acid heaths of north west Kent (including Charlton, Chislehurst, Hayes and Keston); Tunbridge Wells and Rusthall Commons ('On all the bogs, very common', Thomas Forster, *Flora Tonbrigensis*, 1816); at Hothfield; and at Willesborough Lees. There is also an isolated record for a bog at Degg's Wood, Colliers Green (TQ7538) contributed by A.W. Hudson of Cranbrook to Hanbury & Marshall (1899), who considered the species to be very local in Kent, in spongy bogs on heaths.

Hothfield, main bog, habitat. Photo by David Steere, 2 July 2013

Bog habitat in Kent has diminished since then. The north west Kent records became reduced to Keston Bog, from which Marsh St John's-wort disappeared at some time after 1950. In the Tunbridge Wells area, it was still present at Hawkenbury Bog (TQ5937), at least until the county survey of 1970-1981, published as Philp (1982); but this very small site was actually in East Sussex, vc14, and subsequently became over-vegetated and dried up, with the loss of this and other bog species. At Willesborough Lees, *Hypericum elodes* was present before 1829, but does not seem to have been seen since; currently, tree cover has modified the nature of the habitat. At Gibbons Brook, the species has not been recorded since 1925 (J. Walton). In the High Weald, the Colliers Green site has not been re-found, but has been compensated by the discovery of the *Hypericum* in 1941 (subsequently noted by Francis Rose with *Sphagnum subsecundum*) in an acid swamp by Louisa Lake, Bedgebury.

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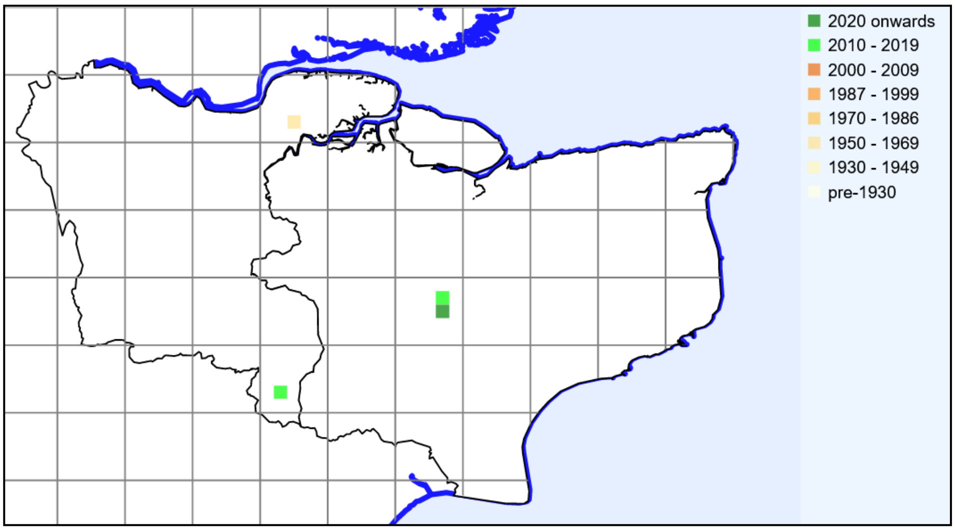
[320] Hanbury & Marshall (1899) attribute this find to Samuel Doody, but this is not what the *Synopsis* actually says, Doody's find being one at Bagshot Heath, in Surrey.

Philp (1982) gave Bedgebury, Hothfield and Hawkenbury Bog (although in vc14) as current sites. With the loss of the last of these, only Bedgebury and Hothfield remained for Philp (2010) and these are the only Kent sites now. Its future at Hothfield, on a managed reserve, appears reasonably secure. Survival at Bedgebury (where it has not been recorded since 2011) depends on scrub maintenance in order to avoid being shaded out.

Hothfield, with *Juncus bulbosus* (Bulbous Rush).
Photo by Lliam Rooney, 4 July 2010

Hypericum elodes grows on damp mud or in shallow water (rarely up to 50 cm deep) over acid ground and spreads via creeping or submerged shoots. Normal plants are hairy, which distinguishes the species from others in the British Isles except for *Hypericum hirsutum* (Hairy St John's-wort), a plant of dry habitats. The rounded stems, leaves without black glands and sepals with fringing reddish glands distinguish *Hypericum elodes* from other St John's-worts of wet habitats.



***Hypericum elodes* Kent records to 2023 mapped at tetrad level, from BSBI database.**

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Bedgebury	TQ7322	Access land	2 April 2011	KFC meeting	Eastern edge of Lousia Lake in sphagnum flushes. Benefiting from some work undertaken by Forestry Commission (prompted by JP) for clearance of encroaching sallow and *Rhododendron ponticum*.
Hothfield	TQ9645 and TQ9646	KWT managed reserve, SSSI	(1) 23June 2022 (2) 11 July 2019 (3) 1 July 2019 (4)2 June 2019 (5) 17 September 2018	(1) & (2) AL (3) AL &JM (4) & (5) AW (6) DS (7) BW (8) DS	(1) TQ 968 456. (2) TQ 9673 4610, in Bog 4, M29 *Hypericum elodes* soakaway. (3) TQ 9697 4568, top of Bog 2, M29 *Hypericum elodes* soakaway (4) & (5) TQ9645,

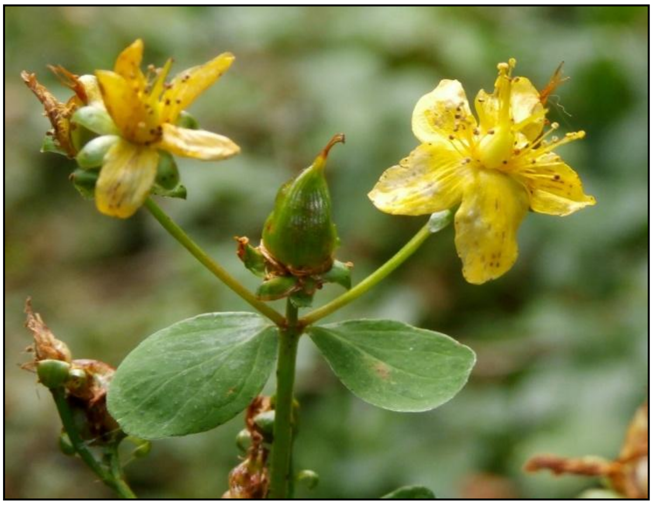
			(6) 17 July 2016 (7) 8 August 2015 (8) 6 July 2014 (9) 9 September 2011 (10) 15 June 2010 (11) 25 May 2010	(9) SB (10) JA (11) GK	(6) TQ9645,main bog. (7) TQ9645. (8) Hundreds of flowering stems in small area of main bog. (9) Area of plants 2 x 3 metres at TQ 96735 46100 in northern bog (no. 6). (10) Sample record: a plant just in flower plus seven linked patches by bridge walkway over bog no. 2 at TQ 96826 45659. (11) In main bog (nos. 3, 4) and southern bog (no. 2), and bog between main and northern (no.5).

Hypericum maculatum Crantz (Imperforate St John's-wort)

vc 16; gone from vc 15

Rarity / scarcity status

Hypericum maculatum is common in Wales and West Midlands, with a widespread distribution across the remainder of the British Isles albeit with some gaps, of which Kent is one. Its conservation status in England and in Great Britain as a whole is of 'Least Concern', but in Kent it was considered possibly extinct when the list of plants to be covered by this register was first prepared (2010), leaving only a genetic trace in its hybrid, *Hypericum x desetangsii*. However, since then its continued presence has been confirmed in two or three localities, and it is treated as **rare**.



Preston Hill. Photo by Geoffrey Kitchener, 21 August 2014

Account

The first published Kent record for Imperforate St John's-wort is by Daniel Cooper in his *Flora Metropolitana* (1836), which he lists as *Hypericum dubium* at Charlton Wood. However, it is not always possible to be certain of the intention of early literature references, where *H. quadrangulum* was applied to both Imperforate St John's-wort and the Square-stalked St John's-wort (*H. tetrapterum*). Hanbury & Marshall (1899) regarded it as rare in Kent on the basis of known records, in hedges or on stream-sides, usually on a stiff soil.

Preston Hill. Photos by Geoffrey Kitchener, 21 August 2014

They believed, however, that it ought to be found more frequently in the west or central Weald than the relatively few records cited. This is to a degree borne out by Philp (1982), which gives eight tetrad records from damp woods, hedgerows and streamsides in the west of the county, largely in the Weald. There appear to be no validated East Kent records other than one from near Folkestone by B.D. Jackson, in Hanbury and Marshall's listing.

The eight tetrad records from Philp (1982), however, became nil in the 1991-2005 survey published as Philp (2010), with the supposition that the species might well be extinct in the county. There is no apparent reason why this should be so, nor have any national trends of decline been identified. The continuity of record at the Preston Hill, Shoreham site from 1966 to 2014 and at Tunbridge Wells Common from 1962 to 2023 suggests that it may be worth reviewing other sites for continued presence.

Tunbridge Wells Common. Photo by Daphne Mills, 26 June 2021.

Hypericum maculatum is a perennial favouring damp and/or shaded habitats, which may be of a marginal character. A clay soil may assist in providing the damp substrate, and the two records given below where plant grew over chalk (Preston Hill and Pratt's Bottom) seem to have involved a superficial layer of clay as well. At Tunbridge Wells Common, however, the geology is the Tunbridge Wells Sand Formation and the aspect is fairly open, albeit that it is marginal to tree cover. The species may be distinguished from *H. tetrapterum*, which generally grows in damper habitats, by the latter having more broadly winged stems, smaller flowers and sepals which are as long as the petals (half as long in *H. maculatum*). From *H. perforatum* it may be separated by possessing a 4-lined stem (*H. perforatum* 's stem is 2-lined), more rounded leaves without the abundance of pellucid glands in *H. perforatum*'s 'perforated' leaves and broader sepals.

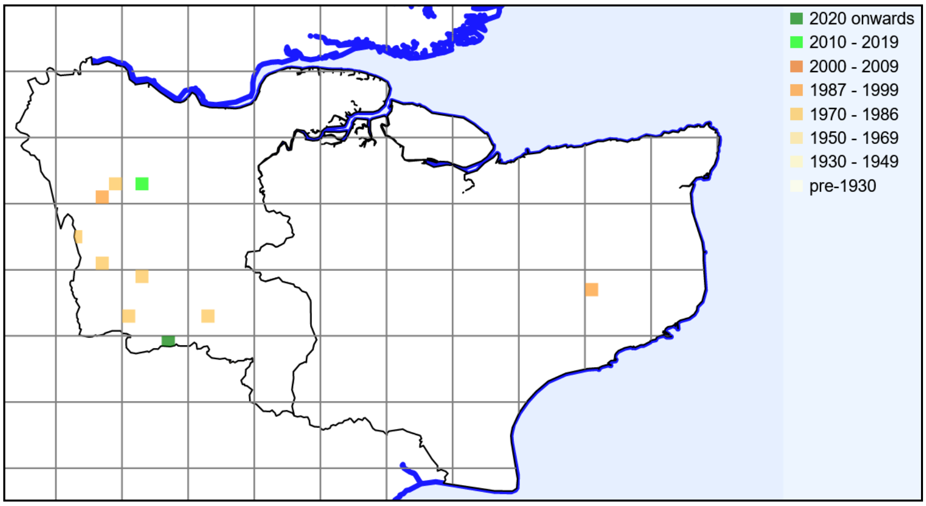
However, plants intermediate between *H. maculatum* and *H. perforatum* are found, being the hybrid, *H.* x *desetangsii*. This is partly fertile and persists or spreads in the absence of the Imperforate St John's-wort. This degree of independence would be compatible with its treatment as a separate species*, H. desetangsii*, as is the case in Sell & Murrell's *Flora of Great Britain and Ireland* (vol.1, 2018). A table is given here for distinguishing between the different taxa.

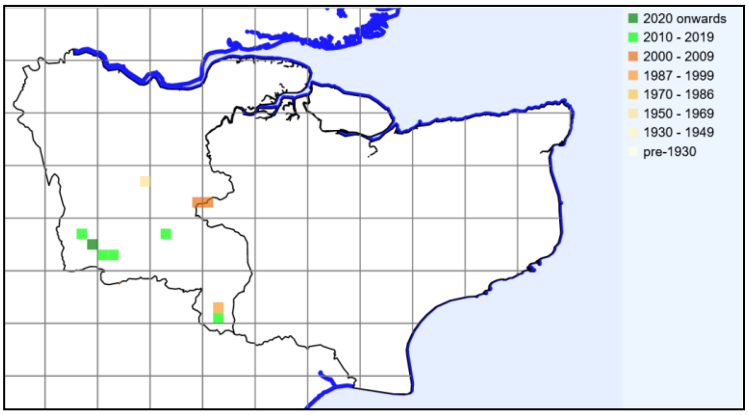
	H. maculatum* subsp. *obtusiusculum	***H. perforatum***	***H.* x *desetangsii***
Stem lines	4 strong lines	2 lines	Usually 4 lines, 2 weak or absent; ranges from almost completely 4-lined to 2 lined
Leaf venation and glands	Densely reticulate venation, generally no pellucid glands or only a few in upper leaves	Numerous pellucid glands	Usually moderate reticulation with some pellucid glands
Petal glandular streaks or lines	Some long streaks or lines, sometimes dot-like.	Sessile black glands	A few dark streaks or lines; can be dots; both can be absent, although black marginal glands present
Sepal shape	Wide to narrow (1.2-2mm) [narrow oblong sepals and incomplete subsidiary stem-lines may be indicative of recent introgression with *H. perforatum*]	Narrow / linear, 0.8-1mm wide, very acute	Range between parents: intermediate condition is medium-width
Sepal apex	Tip denticulate-eroded (but not always so, even on same flower)	Long acute apex	Range between parents, always with some denticles (erosion at the tip). Intermediate condition is apex obtuse-erose and often apiculate. First generation hybrids tend to have tips eroded-denticulate but with a central acute apiculus, like the apex of *H. perforatum*

The range of variation encompassed by the hybrid is such as makes it difficult to separate it from true *H. maculatum*. This was brought to the fore by an examination of the Tunbridge Wells Common plants by a joint KBRB/SBRS meeting in August 2023 which found that the large patch of what had previously been determined as *H. maculatum* encompassed a range of variation, e.g. some stems bore four strong lines, but in others two of them were weaker; sepals were generally broad, often exceeding 2mm, but could include an apiculus at the eoded-denticulate apex. The identification of *H. maculatum* is being retained for the purposes of this register, but it is acknowledged that a different view could be expressed.

Philp (2010) gives three locations for the hybrid and more recent finds have been made at TQ 7216 3100 near Flimwell, TQ 51805 43311 in the R. Eden catchment near Penshurst and TQ 63092 47335, near the R. Medway east of Tonbridge, both in 2011; also TQ 4602 4601, near the R. Eden east of Edenbridge and TQ 53214 42549, near the R. Medway by Penshurst, both in 2016. There appears to be an association with the Eden and Medway rivers. There are older records in both East and West Kent, well distant from anywhere with records of *H. maculatum*. The hybrid is more likely to be found than *Hypericum maculatum* – see distribution maps below.

Hypericum maculatum **Kent records to 2024 mapped at tetrad level, from BSBI database.**





Hypericum x desetangsii **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Site	Grid reference	Site status	Last record date	Recorder	Comments
Westerham	TQ45H		After 1970, before 1981	Philp (1982)	Recorder was RAC, according to LNHS records.
Toy's Hill	TQ45Q		After 1970, before 1981	Philp (1982)	
Toy's Hill	TQ45R		10 August 1986		Border in Emmetts Gardens; LNHS records give GK as recorder, but no recollection of this.
Pratt's Bottom (metropolitan vc16)	TQ46Q		(1) 27 August 1988 (2) 12 July 1987	(1) GK (2) JP	(1) Rushmore Hill Wood, TQ 475 619, path where clearance had been undertaken for utilities, on chalk with clay overlay.[since become closed canopy woodland, 2020]. (2) Birthday Wood, TQ 475 619,

					appeared in gas main clearing, intermittently along 30 yds of open ride.
Well Hill	TQ46W		After 1970, before 1981	Philp (1982)	Hollows Wood, JP, 1978 according to LNHS records.
Oxleas Wood (metropolitan vc16)	TQ4475		18 May 2010	JSw	TQ 440 758, south east[?] boundary of Oxleas Wood, LNHS meeting. [Not refound, Aug 2020, RMB]
Preston Hill Country Park	TQ5336		(1) 21 August 2014 (2) 1966 to 27 June 2013 (3) After 1970, before 1981	(1) GK & SK (2) RMB (3) Philp (1982)	(1) 13 plants/clumps seen, along sides of path through mixed deciduous woodland where there are breaks in the canopy, scattered from TQ 5312 6336 (alt. 121m.) to TQ 5322 6324 (alt. 144m), from single-stemmed to c.12 stems. Soil is over chalk, with some clay overlay. Path was subject to encroachment by brambles, and plants sometimes growing through these, they may rely on periodic clearance. Associated ground floor flora included: *Agrimonia eupatoria, Brachypodium sylvaticum, Clematis vitalba, Geum urbanum*, *Hedera helix*, *Heracleum sphondylium*, *Rubus fruticosus* agg., *Tamus communis*, *Viola* sp. One plant of *Hypericum perforatum* was found in the vicinity, but hybrids were not identified. *H. hirsutum* was also present. (2) Presence at this site (given as TQ 533 632) has been recorded by RMB since 26 June 1966, with a sighting again in 1980 and (non-flowering) in 1994. The 2013 sighting was at Preston Hill Country Park, by path where it climbs into woodland, TQ 53 2634, where there were three clumps with 11 stems.
Tunbridge Wells Common	TQ5738	Common land managed by commons conservators	(1) 22 August 2023 (2) 3 August 2023 (3) 12 & 21 June 2021	(1) DCo, NM, GK (2) KBRG / SBRS meeting (3) SL	(1) TQ 57389 38770, a small patch with an outlying single stem c.5m away, stem with 4 strong lines (sometimes subequally strong), pellucid glands absent from leaves, sepals 1.2 - 1.8mm wide and denticulate-eroded at tip, prominently streaked petals with long dark lines. At margins of common where land had been added to the common pursuant to a 2016 order for exchange with land deregistered elsewhere under Commons Act 2006. Now grassland, but formerly drive and grounds of Park View House. (2) TW TQ 57389 38770, a small patch with an outlying single stem c.5m away, stem with 4 strong lines (sometimes subequally strong), pellucid glands absent from leaves, sepals 1.2 - 1.8mm wide and denticulate-eroded at tip, prominently streaked petals with long dark lines. At margins of common where land had been added to the common pursuant to a 2016 order for exchange with land deregistered elsewhere under Commons Act 2006. Now grassland, but formerly drive and

					grounds of Park View House.common, TQ 57663 38939, a large patch at crossroads. Some doubt was expressed as regards whether this was the species or x *desetangsii*, and it is apparent that the patch encompasses a degree of variation, with some stems bearing 4 strong lines and others having 2 of them weaker, and with sepals varying on the same plant or flower, but being generally of maculatum width and shape (2mm wide or more) albeit that some were bearing an apiculus at the eroded-denticulate apex. [This location is the same as 2021 and was excavated for utilities in January 2024.] (3) TQ 57663 38939 / TQ 57669 38942, a small area of herb-rich turf between eastern corner of Fire Tree Road and path, at crossroads on common between Major York's Road, Hungershall Park and Fir Tree Road. A small, clonal non-flowering colony from which a specimen was gathered by DM and brought to flower indoors, conf. GK. Associated spp *Lotus corniculatus*, *Centaurea nigra* agg., *Plantago lanceolata*, and crossroads generally has good flora, e.g. *Carex caryophyllea*, *Briza media, Danthonia decumbens*, *Carex demissa*, *Carex binervis* and *Linum catharticum*. Strongly 4-lined stem (not winged), no pellucid leaf glands, sepals 2-2.5mm wide, variable with denticulate-eroded tip. Recorded from the common by CAS, 1962.
Chiddingstone Hoath	TQ54B		After 1970, before 1981	Philp (1982)	
Hall's Green	TQ54J		After 1970, before 1981	Philp (1982)	
Rusthall	TQ54K		21 June 1991	JP	Rusthall cemetery / Shadwell Wood.
[Lamberhurst]	[TQ63S]		[After 1970, before 1981]	[Philp (1982])	This is probably in vc14, but within the administrative county of Kent.
Pembury	TQ64G		After 1970, before 1981	Philp (1982)	

Hypericum montanum L. (Pale St John's-wort)

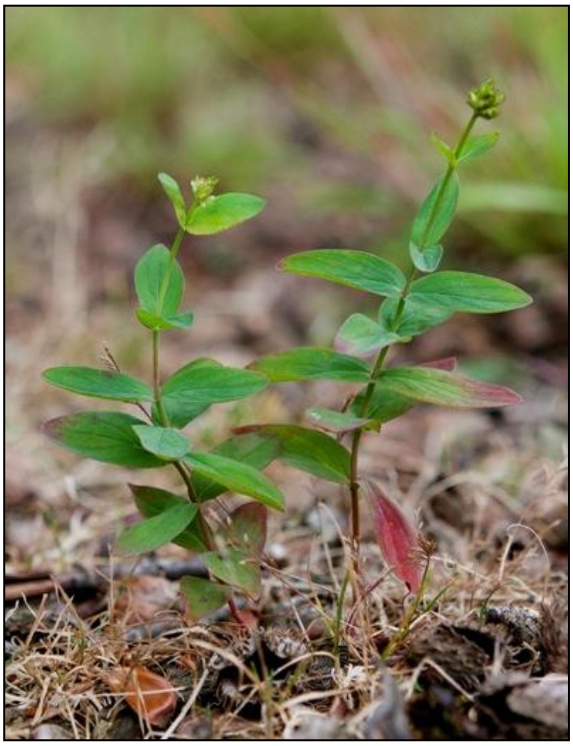
vc 15 and (lacking recent confirmation) 16

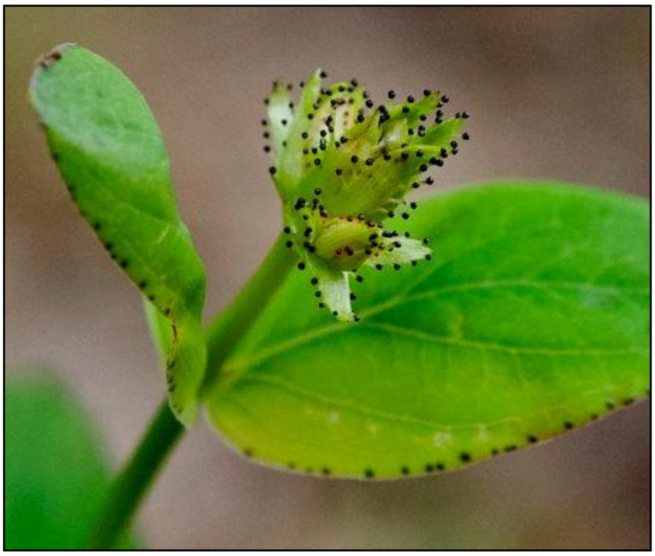
Rarity / scarcity status

Hypericum montanum is a plant growing generally on chalk and limestone and in the British Isles confined to England and Wales, where it is fairly widespread but local. In Great Britain as a whole it is treated as **Near Threatened**; for England, however, its conservation status is currently one of 'Least Concern'. In Kent, it is **rare.**

Account

Pale St John's-wort was first mentioned for Kent by Christopher Merrett (*Pinax rerum naturalium Britannicarum*, 1666) as 'on the Hedge side beyond *Lew[i]sham'.* Hanbury & Marshall (1899) regarded the species as rare, growing on banks and in bushy places, and gave a number of records, all of them in West Kent (except for Bysing Wood, Faversham, 1746). They considered that it preferred the borderline between sand and chalk, '*i.e.*, a somewhat cretaceous sand or a somewhat sandy chalk'.





Snowdown. Photos by Alfred Gay, 25 July 2017

This geological preference was also indicated by some of Francis Rose's records in the 1940s and 1950s. These included a sunny hedgebank at a wood border on the junction of chalk and Thanet Sand (west edge of small wood, Well Wood, near Nash, Keston, 1954-55); the roadside bank of the A2 [now the A296], again on the junction of chalk and Thanet Sand, bordering The Thrift, Stone [but presumably nearer Bean], 1945; and in open scrub on a slightly sandy, but chalky bank at the north end of Darenth Wood by the A2 [now the A296], 1946. All these are represented by specimens in **MNE**, but Francis Rose also referred[321] to three 1946 localities about Darenth Wood, and their correspondence to a site in a wood between Greenhithe and Southfleet, noted in manuscript by Samuel Doody (1656-1706), demonstrating long continuity. Chalky ground with an overlay of loam in places also provided another of Francis Rose's sites (1957-65), at Longreach Wood, Stockbury, where he found the species in roadside scrub in open glades and at the edge of beechwood (this may have been near the current roadside nature reserve by the A249 at TQ8360, although the road was enlarged here on the north western side after 1960 when dualled)[322]. The geology is similar at the Snowdon site, mentioned below, where the soil is sand over chalk with a thin layer of humus from a nearby beech tree.

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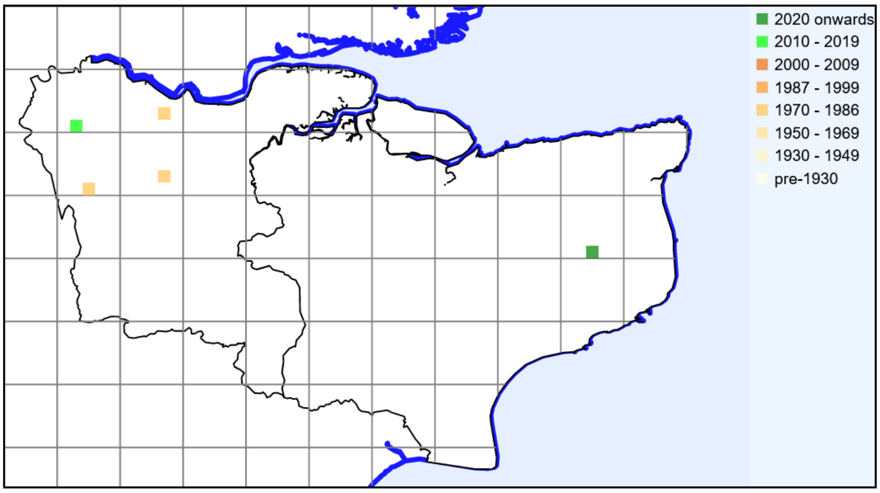
[321] *Botanical Society and Exchange Club Report for 1946-47* (1948): **13**: 286.

[322] In litt., 1998, Owen Davis referred to the former site as at TQ 828 602, but the *Hypericum* then no longer to be found, impenetrable brambles and scrub being present. Francis Rose's MS Flora refers to about 15 plants in 1965, on steep scree in chalk scrub on the north side of the main road.

Darenth Wood (TQ57R) and East Hill, West Kingsdown (TQ56R) were the only localities mentioned in Philp (1982), and a woodland ride near Woolage Village (Snowdown) is the only site given in Philp (2010) and the only confirmed recent (2017) site, so the species has remained rare in Kent. Eric Philp's surveys did not include metropolitan West Kent, where the plant had been known in the vicinity of Elmsted Woods station from 1977, and more widely since 1944, although the only recent record of it is in cultivation in an Elmstead Lane garden, from which it may since have gone.

Snowdown - habitat. Photo by Sue Buckingham, 25 July 2017

Hypericum montanum is a stiffly erect perennial of warm, well-drained soils. It perhaps most closely resembles *Hypericum hirsutum* (Hairy St John's-wort), which occupies similar habitats. It is, however, a less hairy plant overall, the stems (in Britain) are glabrous, the broader leaves are virtually hairless above and have a row of black glands along the margins beneath. The flowers are pale yellow (hence, Pale St John's-wort).



***Hypericum montanum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Site	Grid reference	Site status	Last record date	Recorder	Comments
Elmstead Woods (metropolitan vc16)	TQ4270		(1) 1990 (2) 1987	(1) RMB (2) JP	TQ 422 706, on steep bank of Station Approach. Smothered by gorse, 1998; no longer present in 2003 (bank dominated by ivy); but present on 2 August 2014 as a large patch, gardened round in garden at 41 Elmstead Lane (LNHS meeting) [not seen from road, August 2024, GK]. Recorded on Thanet Sand at lane hedgebank in Elmstead Lane by FR in 1943. (2) Sundridge Park golf course, behind the mansion on scrubby wooded slopes near the railway line. Also 1985 in wooded area near railway.
West Kingsdown	TQ56R		(1) 26 June 1987 (2) 1976 (3) After 1970, before 1981	(1) & (2) JP (3) Philp (1982)	(1) Scrubby grassland at Hog Wood/High Castle Wood, East Hill (this refers to the High Castle Wood side of the footpath, on the

					slopes). [Not seen in 2009.] (1) High Castle Wood, East Hill. One plant at edge of ride on north side. (2) Scrubby grassland on thin sandy soil overlying the chalk.
Darenth Wood	TQ57R		(1) After 1970, before 1981 (2) 1976	(1) Philp (1982) (2) JRP	(1) Scrubby grassland on thin sandy soil overlying the chalk. (2) 'A new locality', near the 'motorway'. [HM Pratt described a 1955 location as very few plants by a manhole cover on south verge of Watling Street at north boundary of Darenth Wood; his map would place it at c. TQ 5799 7312.]
Darenth Wood	TQ57W		1984	FR	By A296 (former A2).
Painters Forstal	TQ9958		17 May 2012	MP	Churchmans Farm, TQ 991 584; record needs confirmation.
Seasalter	TR0963		30 June 1990	JP	TR 095 635.
South of Snowdown, west of Woolage Village	TR2450		(1) 15 August 2020 (2) 25 July 2017 (3) 17 July 2000 (4) Between 1991 and 2000 (5) 20 June 1985	(1) SB (2) KBRG meeting (3) JP (4) EGP (Philp, 2010) (5) JP	(1) At least 4 robust plants viewed in same place as seen in 2017. Probably more plants out of view. (2) Nine plants scattered over c. 10m of mostly bare unshaded ground at TR 2509 5005 at the edge of a wood and above a deep railway cutting. Plants varied in height from c. 15 to 40 cm and were mostly in fruit. The soil is sand over chalk with a thin layer of humus from a nearby beech tree. Associated plants: *Luzula forsteri, Inula conyzae, Veronica officinalis, Potentilla sterilis, Viola reichenbachiana* and *Viola hirta*. This narrow strip of ground appears to be cut regularly as part of routine railway maintenance, keeping it from scrubbing over. (2) Woods south of Snowdown (a small wood west of the railway line). (3) Small colony in woodland ride near Woolage Village, given as TR25K. There is a 1966 record by FR and his MS Flora mentions a sighting by PG of 2,000 plants in seven localities in this area.

Hypochaeris glabra L. (Smooth Cat's-ear)

vc 15; probably gone from vc 16

Rarity / scarcity status

Hypochaeris glabra is an annual of nutrient-poor soils, frequent in East Anglia and the Channel Islands, but otherwise locally scattered in the British Isles. It is regarded as **Vulnerable** to the risk of extinction in England and in Great Britain as a whole. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 31% in the likelihood of recording the species. In Kent it is less widespread than it was in the 1940s. It would have been considered rare in the county on the basis of the data given in Philp (2010), but more records have been made since, and it is to be treated as a **scarce** Kentish plant. It is a Kent axiophyte, and so is an indicator of good habitat.

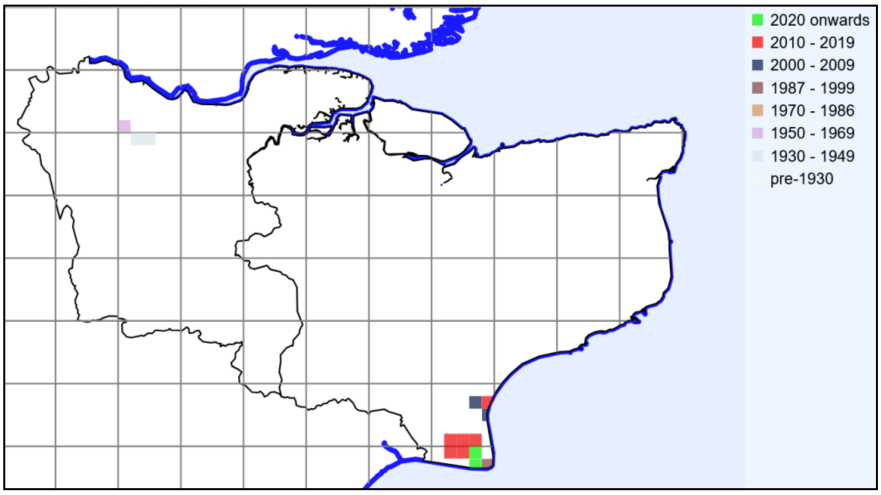
Account

The first Kent record appears to have been published by William Curtis in his *Flora Londinensis* (vol. 3, 1778-1781), where he describes the species as having flowers the size of a silver threepence and seen by him 'in tolerable abundance on *Black-heath*, particularly under Greenwich Park Wall, on the South-side'. Subsequent historic records also indicate terrain of a gravelly or sandy nature: Woolwich Warren (where seen by Nathaniel Winch, published in Turner and Dillwyn's *The Botanist's Guide through England and Wales*, 1805); sandhills (*Phytologist*, N.S. vol.5, 1861) and rough fields near the Chequers (1878, specimens in **SLBI** and elsewhere), both between Deal and Sandwich; sandy ground near Sevenoaks (1837). Tunbridge Wells and Rusthall Commons (Edward Jenner's *Flora of Tunbridge Wells*, 1845); on dry sandy heaths and fields (Thomas Forster's *Flora Tonbrigensis*, 1816); and Frederick Hanbury's records given in Hanbury & Marshall (1899) at Rodmersham (the underlying geology in this area is mostly chalk, but the site may have been on Thanet Formation sands) and on sandy ground near New Romney.

Lydd Ranges. Photos by Sue Buckingham, 7 August 2012

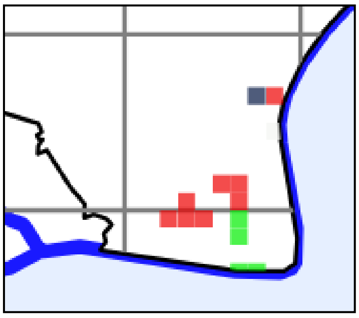
Smooth Cat's-ear was reckoned by Hanbury & Marshall (1899) to be rare and this has remained the case, but by the 1940s and 1950s it was still present in a range of sites across the county. There are specimens in **MNE** gathered by Francis Rose west of Farningham Wood in open heath on Thanet Formation sands (1945, also seen by R.A. Boniface in 1948 at TQ 533689); south of Joydens Wood in open sandy grass heath on Blackheath Beds (1948); north of Deal on fixed dunes not far from the sea (1949); at Hothfield Common in open grass heath on Folkestone Sand (1948, 1954); at Romney Warren, growing up to 33cm high, in old fixed dune pasture (1946); at Greatstone on fixed dunes (1950); and at Lydd Common in ancient fixed dune pasture (1954).

After 1954 there is a gap in sightings. The 1971-1980 county survey (Philp, 1982) did not locate any plants, but it is likely that plants were simply overlooked as they are not easy to see when the flowers are closed – they only open in the morning, in full sun. Francis Rose was still able to find plants at Farningham Wood in 1982 and at Romney Warren in 1986. The 1991-2005 county survey (Philp, 2010) recorded plants in three tetrads (TR02K, Lydd, and TR02X/Y, St Mary's Bay), but it has since become apparent that the species is much more extensive in the Dungeness/Lydd area, with sightings in eight tetrads (12 monads) during 2010-24.



Hypochaeris glabra **Kent records to 2024 mapped at tetrad level, from BSBI database**

Hypochaeris glabra **Kent records to 2024 mapped at monad level, from BSBI database**



It is possible that the plant still remains undetected at other historic sites, such as between Deal and Sandwich.

Hypochaeris glabra is an annual, requiring open conditions for establishment and is described by Stroh (2015)[323] as an early colonist of periodically disturbed, dry, nutrient poor sandy or gravelly acidic soils in areas that have open, sunny and warm aspects. The relationship with periodical disturbance is tied with historic arable records which are, however, decreasingly applicable in the British Isles; and in Kent were limited in any event (see above for Tonbridge area, 1816, and Deal, 1878). Periodic disturbance is not so evident in relation to current Kent sightings. Many of our recent records are on consolidated sandy shingle with a relatively undisturbed cover of mosses and lichens, and the lack of nutrients slows down natural succession. If it were appropriate to regard the species as an early colonist, this would have to be in the context that colonisation by vascular plants generally in this habitat is a long-protracted process.

Lydd Ranges, habitat, in moss/lichen over consolidated shingle. Photo by Sue Buckingham, 7 August 2012

The species ought not to be confusable other than with *Hypochaeris radicata* (Cat's-ear), with which it sometimes grows. The leaves of *H. glabra* differ in being generally hairless, or nearly so; the florets barely exceed the involucral bracts (whereas those of *H. radicata* exceed considerably); and the plant as a whole is usually smaller. The flowers are generally smaller: 4-15(21)mm across, in comparison with 14-27mm for *H. radicata.* The hybrid between these species has not yet been recorded in Kent, although unconfirmed candidates have been noted. Confirmation would benefit from the presence of sterile achenes, given that intermediacy in flower size is obscured by the overlap of measurements.

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[323] Stroh, P. (2015). *Hypochaeris glabra* L. Smooth Cat's-ear. Species account. Botanical Society of Britain and Ireland. www.bsbi.org.uk/Hypochaeris_glabra_species_account.pdf, accessed 25 September 2015.

Littlestone Warren, growing with *Hypochaeris radicata* (the large flower in the foreground). Photo by Sue Buckingham, 2 June 2014

Site	Grid reference	Site status	Last record date	Recorder	Comments
Lydd Ranges	TR0219	SSSI, MoD land	16 June 2018	SB & OL	On sandy ground at TR 027 196 with *Trifolium scabrum* and *T striatum.*
Lydd Ranges	TR0319	SSSI, MoD land	(1) 13 June 2013 (2) 7 August 2012	(1) OL (2) OL, GK, TI, SB	(1) Around 60 plants along old shingle ridges near to a footpath adjacent to conifer plantation and near to populations found in August 2012 within the Lydd MOD Ranges. TR 03869 19599. (2)(a) Flattish, rabbit-grazed, semi-bare acid ground at TR 03828 19326 (1 plant) and TR 03859 19913 (1 plant). (b) Over 30 plants scattered mostly at TR 036194 and TR 035194, but also in TR 036195. On sandy heathy ground over shingle, semi-bare or shortly vegetated (particularly with moss/lichen layer), heavily rabbit-grazed, often slightly hummocky (plants being both on humps and in shallow hollows), on both sides of a military road near pine plantations. Associates include *Rumex acetosella*, *Sedum acre*, *Sedum anglicum*, *Agrostis* spp, *Teucrium scorodonia*, *Calluna vulgaris*. Plants recorded at TR 03685 19427 (3 plants), TR 03568 19417 (2), TR 03565 19466 (1), TR 03555 19459 (1), TR 03564 19460 (2), TR 03586 19478 (1), TR 03588 19472 (3), TR 03595 19471 (1), TR 03584 19433 (1), TR 03601 19469 (1), TR 03609 19463 (1), TR 03636 19448 (7), TR 03642 19480 (1), TR 03642 19484 (1), TR 03654 19494 (1), TR 03653 19510 (1), TR 03662 19522 (1), TR 03678 19535 (1), TR 03670 19556 (1), TR 03678 19575 (1), TR 03673 19579.
Lydd south	TR0419		2 June 2013	OL	
Dungeness	TR0616	SSSI	20 August 2024	AL & RD	Denge Beach
Dungeness	TR0618	SSSI, RSPB reserve	19 June 2021	JL	RSPB car park margin, dry and sandy. Two plants at TR 06735 18510 and several more at TR 06725 18515 and TR 06733 18506.
Dungeness	TR0619	SSSI, RSPB reserve	(1)10 June 2021 (2) 8 August 2012	(1) CO (2) SB & TI	(1) Present at top of ARC Pit. (2) One plant at TR 06416 19877,

			(2) & (3) 12 May 2011	(2) EGP & DG (3) TI	two at TR 06438 19914, one at TR 0666 1994, on thin sand/peat/ shingle. (2) TR064 198 approx at ARC pits, 20 plants. (3) TR06388 19839 - 160 plants, TR06458 19884 - 18 plants, TR06678 19945 - 26 plants.
Dungeness	TR0716	SSSI	20 August 2024	AL & RD	TR07091675. Denge Beac
Dungeness	TR01Y		27 June 1996	EGP	Not included in Philp (2010), for reasons unknown.
Lydd (west)	TR0203	MoD land	8 August 2012	SB & TI	Seven plants on mown lawn by barracks, TR 0355 2002.
Lydd (east)	TR0521	SSSI	(1) June 2014 (2) 11 June 2013 (3) 2001 (4) Between 1991 and 1998	(1) FJR (2) OL (3)&(4) EGP (Philp, 2010)	(1) TR 0517 2197, TR 0518 2198, TR 0519 2193, TR 0519 2194, T R0519 2199, TR 0520 2198, TR 0520 2199, TR 0521 2196, TR 0522 218, TR 0522 2194, TR 0524 2195; TR 0524 2196, all from survey of Lydd airport lands. (2) Around 40 plants along two old shingle ridges adjacent to the approach road to Lydd. Understood to be a site found by Eric Philp and that there were a few plants about 10 years ago. TR 05071 21845. (3)TR 0504 2179, growing along either side of road at East Ripe, within 10m. (4) Recorded as TR02K.
Dungeness	TR0618	SSSI	June 2014	FJR	TR 06393 18864.
Dungeness	TR0620		15 June 2013	TI	
Lydd Airport	TR0621	SSSI	June 2014	FJR	Plants at TR 0681 2168, TR 0682 2170, TR 0682 2171, TR 0682 2172, TR 0682 2174, TR 0682 2175, TR 0683 2172, TR 0683 2186, TR 0684 2176, TR 0685 2172, all from survey of Lydd airport lands.
Littlestone – St Mary's Bay	TR02T	As to part, SSSI and local nature reserve	(1) 18 May 2008 (2) 18 July 2007	(1) JP, BW (2) JP	(1) TR076262, Romney Warren Country Park. [This grid reference may not be accurate.] (2) TR077260, Romney Marsh Visitor's Centre.
Littlestone	TR02X		(1) 7 July 2002 (2) 23 June 2002 (2) 13 June 2002	(1) & (2) BW (2) EGP & DG	(1) TR0825. (2) TR0824.
Littlestone Warren	TR0826	SSSI	(1) 28 April 2019 (2) 2 June 2014 (3) 5 June 2010 (4) 18 May 2008 (5) 28 May 2006	(1) GK (2) SB & AG (3) KBRG meeting (4) JP, BW (5) JP	(1) TR 08789 26380, on consolidated sandy ridge, sparse vegetative cover, abundant, beginning to flower. (2) Thousands of plants, carpeting the Warren. (2) On consolidated sandy ridges at TR 08890 26770 and elsewhere on the Warren. Extent not readily ascertained, as no flowers expanded. (Seen also by GK at TR 08888 26784 on 15.06.2010.) (3) TR 088 262. (4) TR 088262, abundant.
St Mary's Bay	TR02Y		13 June 2002	EGP & DG	May relate to TR0826 entry above.
Romney (Littlestone) Warren	TR0927		28 May 2006	JS	TR 0915 2746.

Hypopitys monotropa Crantz (= *Monotropa hypopitys* L.) (Yellow Bird's-nest)

vc 15 and 16

Rarity / scarcity status

Hypopitys monotropa is infrequent in England and Wales, rare in Scotland and Ireland, and is regarded as an **Endangered** species in both England and Great Britain as a whole. In England, a comparison of records over the periods 1930-1969 and 1987-1999 produced a calculated decline of 52% in the extent of geographical areas occupied. A similar decline in the number of sites in the administrative county of Kent has been noted over the shorter comparison periods of 1971-80 and 1991-2005, although whether this actually represents a decline is questionable; indeed, the species, although uncommon in the county, falls somewhat short of qualifying as scarce. It is a species of principal importance under s.41 Natural Environment and Rural Communities Act 2006 and, as a Kent axiophyte, is an indicator of good habitat.

The Larches, Detling. Photo by David Steere, 14 July 2013

Account

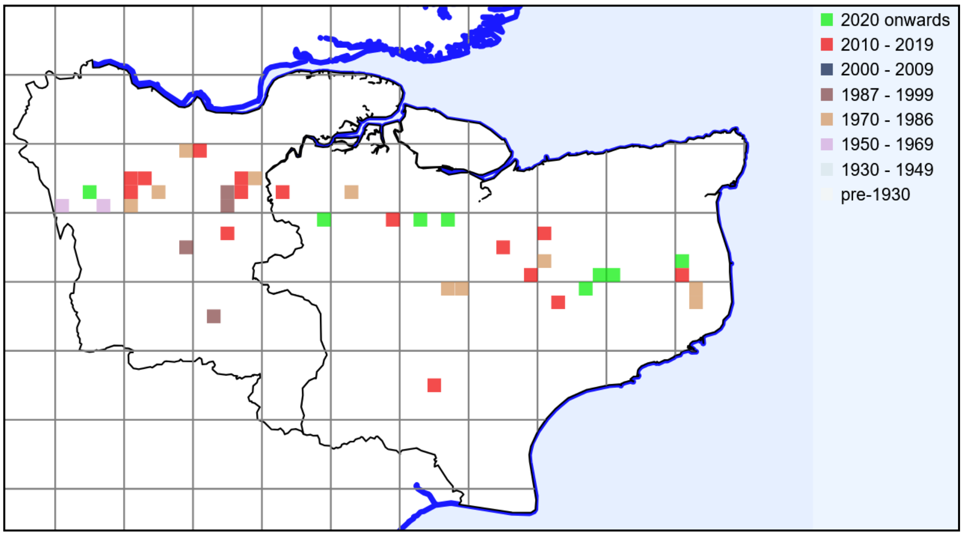
Yellow Bird's-nest was first mentioned for Kent by John Blackstone in his *Specimen Botanicum* (1746) as reported by Mr. Jarvis ('an eminent Surgeon and curious Botanist') from 'In a Wood near *Maidstone*, *Kent*'. Historical records refer to its presence under various trees: in woods of beech and fir (near Cobham, given by H.C. Watson in *The New Botanist's Guide*, 1835, as found by William Pamplin); below ashes and alders (at Stowting, given in the same publication, as found by Sir William Hooker); in fir woods near Barfreston (reported by the Rev. S.H. Cooke for the 1899 *Kent Flora*); in a fir copse near Ringwould (noted by Frederick Hanbury, before 1899); and under beech on the Wye hills (recorded by John Jeffrey, curator at Edinburgh Royal Botanic Garden, before 1899). The predominance of locations under conifers and beech indicates the species' preference for deep shade.

High Elms. Photo by Fred O'Hare, 17 July 2012.

Hanbury & Marshall (1899) regarded the species as uncommon, citing records from across the county. This cross-county distribution was still shown by data in Philp (1982), with records from 12 tetrads following the chalk of the North Downs. The 1991-2005 survey published in Philp (2010), however, gave only half this number of tetrads, nearly all in West Kent. The species was then assessed as a rare plant usually found in woodland with deep leaf litter and appearing to be in considerable decline. This, however, is not supported by records for the period 2010-24 which relate to 23 tetrads spread across the county almost equally as between East and West Kent, and exceeding the number for both earlier surveys, albeit relating to a larger area as one of these tetrads falls within metropolitan West Kent. The fact that 2010-24 records are for the same number of monads and tetrads indicates that populations are relatively small and discrete, without ever amounting to enough in any one locality to extend across a monad boundary in the same tetrad. Exceptionally, populations in Knowle Wood, Barham were observed in 2024 as present in two adjoining monads and totalling approximately one thousand spikes.

The 2010- 24 tetrads show very little coincidence with those featuring in the 1991-2005 survey, and the latter included none of those given in the 1971-80 survey. Accordingly, the evidence of population trends in Kent is not straightforward.

There is, however, some evidence of a degree of continuity of occurrence at sites, but this may be variable or intermittent. An example is a site at Lullingstone (TQ5364), in a tree belt of beech and other species, where Yellow Bird's-nest was seen in 2000 and 2004, did not show during searches in 2006 and 2013, but put forth two spikes in 2014. A site at Cuckoo Wood, Downe (TQ4462) with records from c. 1920 onwards has been known for the appearance of one or two spikes in 'normal' years, but often none: from June to August 2012, however, a succession of spikes occurred, the earliest gone before the last broke ground, with a total of at least 1,000. That year, 2012, seems to have been a successful one for the species, with six sites reported in the county. The dull, wet summer may have been a factor in this success, with the species' woodland habitats being even darker than usual; but in ascertaining what is beneficial for, or detrimental to, Yellow Bird's-nest, it is probably at least as relevant to ascertain what affects the growth of associated fungi.



***Hypopitys monotropa* Kent records to 2024 mapped at tetrad level, from BSBI database**

Hypopitys monotropa, which lacks chlorophyll such as would enable it to photosynthesize as vascular plants normally do, was previously thought to be saprophytic, gathering nutrients from decaying organic matter. It is now, however, considered to obtain its energy from neighbouring trees via *Tricholom*a fungi[324]. Yellow Bird's-nest has been found in relationships with species of *Tricholoma* varying with the associated species of tree, e.g. *T. terreum* in the case of *Pinus sylvestris*. The relationship between the plant and fungus in Kent is being investigated by Joyce Pitt, who has known *Tricholoma orirubens* growing for several years with Yellow Bird's-nest in beech plantations on chalk at High Elms; the plantation has some pine also present. In 2015, she noted the species as accompanied by *Tricholoma scalpturatum* at Hartley Wood under secondary hornbeam.

Hypopitys monotropa, because of its colourless character, is not readily confusable with any other species in Britain except, perhaps, *Neottia nidus-avis* (Bird's-nest Orchid) or *Lathraea squamaria* (Toothwort). Neither of these, however, has the drooping flowers of Yellow Bird's-nest (although these turn upright in fruit) and their flowering spikes tend to be more substantial; Toothwort's is one-sided. As a species of deep shade in leaf litter, Yellow Bird's-nest tends to grow without the accompaniment of other vascular plants, other than the trees which shade it. If it reaches fruiting stage, it may therefore be as readily discovered in autumn as earlier; and indeed, the dead spikes may be capable of being observed through winter into spring.

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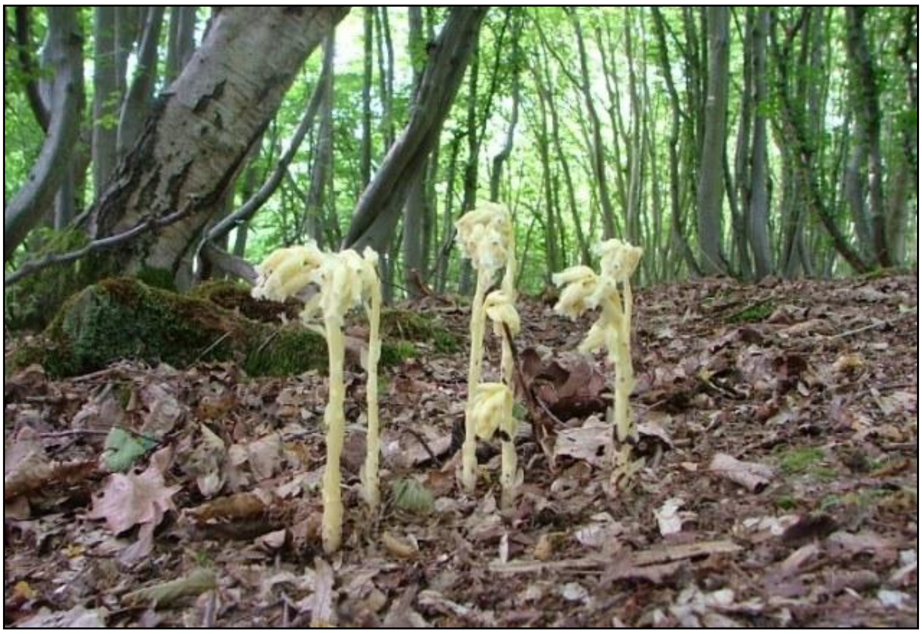
[324] Leake, J.R., McKendrick, S.L., Bidartondo, M. & Read, D.J. (2004). *New Phytologist*. Symbiotic germination and development of the myco-heterotroph *Monotropa hypopitys* in nature and its requirement for locally distributed *Tricholoma* spp.



Woodchurch. Photo by Charles Boxer, June 2015

Hypopitys monotropa has two subspecies, *monotropa* and *hypophegea*. These are usually separated on the basis of the petals, stamens and carpels being hairy in subsp. *monotropa* and glabrous in subsp. *hypophegea*; and the style being equal or longer than the ovary in the case of the former, but equalling or shorter in the latter. The subspecies apparently are not always distinct, but both have been recorded in Kent, generally from a period when they were treated as separate species, and there was a greater incentive to distinguish between them. '*Hypopitys hypophegea'* ceased to be treated in standard British Floras as a full species from 1987.

Site	Grid reference	Site status	Last record date	Recorder	Comments
High Elms, Cuckoo Wood (metropolitan vc16)	TQ4462	L. B. Bromley-owned country park and local nature reserve, SSSI	(1) 18 June 2022 (2) 23 July 2015 (3) 18 July 2012 (4) 20 June 2012 (5) 17 June 2012 (6) 5 November 2011	(1(SLo (2) & (3) DJ (4) JP (5) FOH (6) JP	(1) TQ 44697 62403, High Elms Country Park. (2) c. TQ445625, across the pathway and around an old tree stump, about 50 plants, quite robust and about 15 cm tall, going over but recognisable. (3) TQ4465 6234, three singles flowering under beech. (4) In beech plantation below orchid bank. (5) At least 1000 spikes (according to recorder, in a normal year one or two specimens, often none). (6) Fruiting in beech/pine plantation below main orchid bank. Records from Cuckoo Wood go back to c. 1920.
Halstead	TQ4861		22 June 2003	GK	TQ 482 614, one plant in beechwood west of former school buildings; the area has since been redeveloped but the plant's site is relatively unaffected, although not found since.
Ightham Common	TQ55X		After 1990, before 2000	EGP	
Shoreham	TQ56A		(1) 21 Sept 2004 (2) 1992 (3) 1981-87 (4) After 1970, before 1981 (5) 1976	(1) JW (2) & (3) JP (4) Philp (1982) (5) JP	(1) TQ 512 618, Meenfield Wood. (1) Meenfield Wood, on west side of path. (2) TQ 505 619, Andrews Wood. (4) Recorded only as TQ56A. (5) Two groups of plants in one location at Meenfield Wood; tetrad inferred. Records here go back to c. 1950. JP also refers to a site at TQ 508 642, which may have been affected by dense secondary scrub arising after

					the 1987 storm.
Lullingstone Park	TQ5064		1 August 2015	JP	One plant under hornbeam.
Lullingstone Park	TQ5164	Kent C.C.-owned Country Park	(1) 17 October 1993 (2) 1980	(1) & (2) JP	(1) & (2) Grid reference have been given for these records probably better represented by TQ 510 643, in a beech/hornbeam plantation on a south-facing slope overlooking the 9 hole golf course (JP, pers. comm.).
Eynsford-Lullingstone	TQ5364		(1) 24 July 2014 (2) 23 July 2009 (3) 21 July 2004	(1) DJ (2)GT & DW (3) EGP	(1) Two spikes, amongst trees towards the railway fence above the *Epipactis phyllanthes* colony, where known before by recorder (in 2004 and other years). Searched for by RMB in 2006 and GK in 2013 without success. (2) TQ 53348 64343, roadside nature reserve. (3) Recorded as TQ56H and may relate to this site.
Eynsford, Austin Lodge Valley	TQ5463		(1) 1986 (2) 21 June 1981 (3) After 1970, before 1981	(1) JP (2) KFC (3) Philp (1982)	(1) TQ 546 637. (2) West side of path between Romney Street and Upper Austin Lodge. [There is some ambiguity as regards the grid reference data, which may relate to TQ546623. Some tree cover here was lost to golf course construction after 1990.] (2) Recorded as TQ56L and may relate to this site.
Fawkham	TQ5968		(1) 31 July 1982 (2) 27 June 1981 (3) After 1970, before 1981 (4) c.1970	(1) OFC (2) LNHS (3) Philp (1982) (4) PHa	(1) Churchdown Wood. (2) TQ 5959 6839, west side of path in Churchdown Wood. (3) Recorded as TQ56Z; may relate to this monad and to the following site. (4) TQ 5939 6859 (originally recorded as TQ593685Z). This is Churchdown Wood.
Crockhurst Street	TQ6244		1991	MA	TQ 623 444 given as centroid of site being surveyed, Nightingale Wood.
Hartley Wood, Longfield	TQ6168		(1) 2014 (2) 31 July 2012 (3) 1 August 2004 (4) After 1990, before 2000	(1) JP (2) RR (3) JP (4) EGP	(1) Under young hornbeam. (2) In Hartley Wood, 24 spikes at TQ 61363 68242 shown to recorder by P&PH. One week later, recorder revisited, and the number had risen to 37. (3) Under secondary hornbeam, shown to recorder by PH, TQ616678 (4) Recorded as TQ66E, Longfield, and may relate to this site.
Trosley Country Park	TQ66K		After 1990, before 2001	EGP (Philp, 2010)	
Offham	TQ6557		15 June 2011	FB	Three spikes beside one of the paths at TQ 655 578, Moorlands Wood.
Harvel	TQ66L		After 1990, before 2001	EGP (Philp, 2010)	
Holly Hill	TQ6662		June 2011	JD	TQ 66663 62719, woodland, conf. SB.
Upper Halling - Luddesdown	TQ66X		After 1970, before 1981	Philp (1982)	
Great Buckland	TQ6764	Private garden	5 August 2012	BBu	c. 50 spikes, amongst leaf litter and twigs in north-east corner of private garden, TQ 671 644, on west facing slope of North Downs.
Burham	TQ7262	SSSI	1 August 2015	DC	TQ 727 628, growing under yew.
The Larches, Detling	TQ7858, TQ7859	KWT managed reserve, SSSI	(1) 11 July 2021 (2) 30 July 2016 (3) 19 July 2015	(1) DM (2) BW (3) (4) & (5)	(1) TQ 78534 58975, at least 20, slightly different area than before. Also 16 at TQ 78482 58984 and 6 at

			(4) 31 July 2013 (5) 14 July 2013 (6) 7 August 2010 (7) 13 June 2010 (8) 4 July 2009 (9) After 1990, before 2001	DS (6) JS (7) DM (8) RM (9) EGP (Philp, 2010)	TQ 78483 58964 under yew and beech. (2) TQ7858. (3) TQ 78517 58968, three flowering spikes under Beech in heavy Beech litter. Also, Q 78571 58934, group of 10 emerging spikes under an old Beech and young Yew tree in heavy Beech litter. (4) TQ 783 589, three spikes by path in open area of beech leaf litter, away from tree. (5) TQ 784 589, five spikes by path in leaf litter of large beech and small yew. (6) TQ 7815 5950. (7) TQ 7858 5889. (8) TQ 7853 5896. (9) Recorded as TQ75Z and may relate to this site.
Burham	TQ76G		After 1970, before 1981	Philp (1982)	
Dering Wood, Pluckley	TQ8945		4 August 1997	JP	Found under over-stood hornbeam coppice, TQ 895 455.
Trundle Wood	TQ8958	Private woodland	(1) 2013 (2) 26 August 2012	(1) JP (2) RE, R&PB	(2) Fruiting.
Queen Down	TQ86G		After 1970, before 1981	Philp (1982)	
Charing	TQ94U		After 1970, before 1981	Philp (1982)	
Dunn Street	TQ94Z		After 1970, before 1981	Philp (1982)	
Torry Hill	TQ9056		10 July 1995	MN	TQ 902 562, Sweets Wood, one plant.
Erriot Wood	TQ9358		(1) 19 June 2021 (2) 15 August 2015 (2) 30 September 2014 (3) 19 June 2014	(1) JPu (2) KFC meeting (2) LR & JPu (3) JPu	(1) 24 spikes, just appearing in usual place TQ 933 586, a little later this year than usual. (2) TQ9358. (2) TQ 93297 58693, remains of two flower spikes. (3) c. TQ 934 587 in fruit in Erriot Wood on sandy clay overlying chalk, mainly poor sweet-chestnut with oak and hornbeam standards.
Woodchurch	TQ9535		June 2015, 2016	CB	TQ 953 350, Cole Wood, in Hornbeam leaf litter of ancient/semi-natural woodland, understorey largely absent. Did not flower in 2017.
Ospringe	TQ9759		(1) 9 July 2021 (2) 12 July 2022	(1) SB (2) JP	(1) Putt Wood, 3 flowering plants under hornbeam at TQ 97792 59941. (2) 13 flowering spikes in a partial ring with mature *Carpinus be*tulus at Putt Wood
Perrywood	TR0455		11 October 2015	KFC meeting	Four fruiting plants under chestnut coppice at northern edge of lane, TR 04529 55589.
Mystole	TR0951		18 June 2016	KBRG meeting	A cluster of some 40 flowering spikes at TR 09617 51895 under mixed woodland of *Carpinus betulus, Acer campestre* and *Castanea sativa*.
Chartham	TR15B		After 1970, before 1981	Philp (1982)	
Bigbury	TR1157		31 July 2014	AL	About six spikes in chestnut coppice by the roadside at TR 1191 5769. (recorder noted dead spikes from previous year in spring 2014).
Yockletts	TR1247	SSSI,KWT reserve	3 August 2012	LR	TR 12482 47566, in reserve. 33 flowering spikes on the south side of footpath under *Fagus sylvatica*. Associated species were *Corylus*

					avellana, *Crataegus monogyna*, *Fraxinus excelsior* (seedling), *Hedera helix*, *Rubus* agg., *Euphorbia amygdaloides*, *Carex sylvatica* and *Geum urbanum*.
Covet Wood	TR1748		4 August 2024	DH	TR1760 4863. In deep shade, under Beech trees on the eastern side of Covet Wood, c.18m in from the fence running along the edge of the wood. The plants formed a rough arc leading to the base of one of the trees.
Kingston/Barham	TR1950		(1) 26 July 2024 (2) 19 July 2024 (3) 6 July 2023 (4) 28 July 2010 (5) After 1970, before 1981	(1) & (2) DH (3) SC & ML (4) AG (5) Philp (1982).	(1) Knowle Woods (in two monads). Colony (2) TR 1962 5050, where there were 14 spikes around the base of a beech tree 3m SW from the point where the track and permissive path cross. Colony (3) TR 1958 5042 , c.150 spikes around 10 m north of the path, 100m SW of colony 2. Colony (4) TR 1939 5030, over 120 spikes c.15m east of the group subject of 19 July 2024 record, and not present at that time. Colony (5) TR 1945 5036, c.200 spikes in an area about 20m long running parallel to and SE of the permissive path that runs diagonally through the woods. Colony (6) TR 1949 5060 where 128 spikes counted at the NW edge of the wood about 5m SW of the small parking area on Covet Lane, appeared since 19 July 2024 visit. Total 612 for colonies 2-6. (2) TR1937 5030. c.50m into Knowle Wood, 300 to 400 plants, predominantly in a roughly 10m x 10m area but with outliers spread across a larger c. 50m x 50m area . In heavily shaded Beech wood in deep leaf litter on NW facing slope. Most plants fresh and 5 to 15 cm tall but with some of the outliers already having gone over. (3) 29 spikes just emerging in Waterworks Wood TR 19967 50772. (4) TR 197 506, a wood near Heart's Delight Farm. 12 spikes growing beside path under beech and pine. Recorder has seen it more widespread in other parts of the wood in the past. (5) Recorded as TQ15V.
Kingston/Barham	TR2050		26 July 2024	DH	Knowle Woods (in two monads). Colony (1) TR 2001 5078 where 120 spikes counted on the south east side of an old brick water tank (?). Growing through ivy ground cover.
Tilmanstone	TR3051, TR3052		(1) 24 June 2023 (2) & (3) 13 August 2019 (4) 11 August 2019	(1) SC (2) & (3) SC & ML (4) GH	(1) 52 counted TR 30664 52054 to TR 30654 51990. (2) 31 spikes at TR 30670 52049 and 45 spikes at TR 30671 52064. (3) 51 spikes at TR 30665 52016 under sycamore. (4) 23 spikes at TR 30634 51763.
East Langdon	TR34I		After 1970, before 1981	Philp (1982)	
Sutton	TR34J		After 1970, before 1981	Philp (1982)	There seems very little suitable habitat here, both now and earlier.

Kent Rare Plant Register
Species accounts Part I, J & K

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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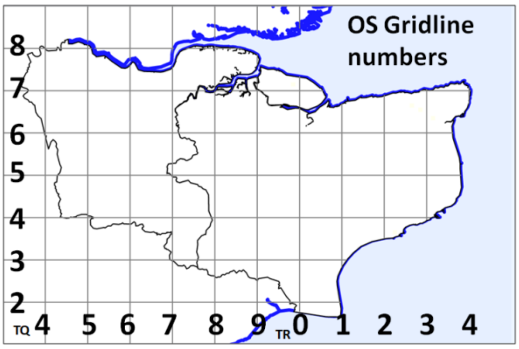
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AL Alex Lockton
AP Alan Parker
BB Brian Banks
BBe Ben Benatt
CEC Carter Ecological Consultants
CFB Chris Foster Brown
CJ Clive Jermy
CJC James Cadbury
CO Colin Osborne
DGS D. Groen-Stocker
DM Daphne Mills
DP David Penney
DS David Steere
EGP Eric Philp
FR Francis Rose
GK Geoffrey Kitchener
IB Ishpi Blatchley
JA Jan Armishaw
JBe Jim Bevan
JCo Jeremy Cotton
JJ Judy John
JN Josie Newman
JP Joyce Pitt
JPu John Puckett
JS Judith Shorter
KBRG Kent Botanical Recording Group
KFS Kate Fidczuk-Sterry
LR Lliam Rooney
LS Leonie Seymour
OL Owen Leyshon
Pho Paul Holt
PW Phil Williams
RAC Ray Clarke
RD R. Dix
RG Bob Gomes
RMB Rodney Burton
RoF Lady Rosemary FitzGerald
RT R. Turley
SB Sue Buckingham
SL Stephen Lemon
TH T. Hurst
TI Tim Inskipp

Other abbreviations and references:

BM =Natural History Museum herbarium	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MNE = Maidstone Museum herbarium	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
Hanbury & Marshall (1899) refers to their *Flora of Kent*	MoD Ministry of Defence	SLBI = South London Botanical Institute herbarium

Iberis amara L. (Wild Candytuft)

vc 15 and 16, but possibly gone from both

Rarity / scarcity status:

Wild Candytuft is a **nationally scarce** native of south central England which grows on bare calcareous ground, currently regarded as casual elsewhere in the British Isles. It is considered to be **Vulnerable** to the risk of extinction, both in England and in Great Britain as a whole, with losses having taken place when myxomatosis reduced populations of rabbits which were maintaining disturbed open conditions. It is a species of principal importance under s.41 Natural Environment and Rural Communities Act 2006 but is **rare** in Kent and, with the last native record being in 2001, may already be extinct in the county.

Account:

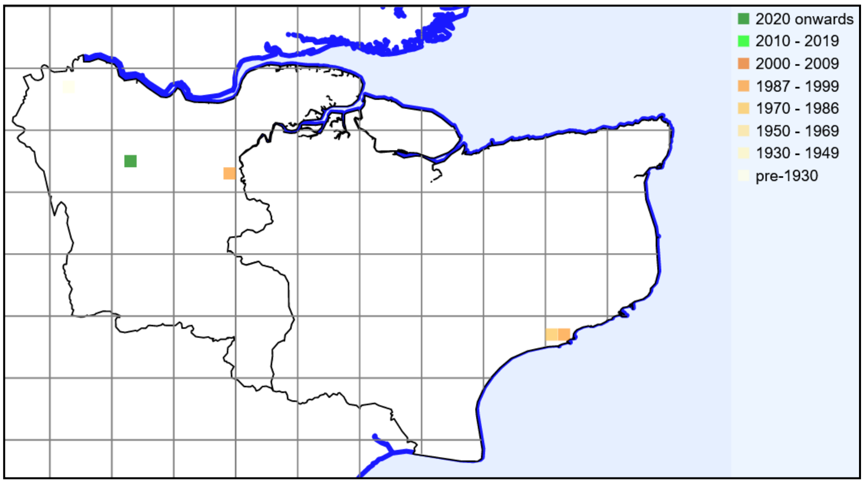
The first published record for Kent was is given by Hanbury & Marshall (1899) as by Christopher Merrett in his *Pinax rerum naturalium Britannicarum* (1666), where he described it as 'On the Clifts beyond *Deal* Castle in *Kent'*. This, however, is preceded by Robert Turner's *Botanologia* (1664) which refers to Sciatica Cresses as growing 'upon old walls, rough and untilled places, by high way sides, and in Corn fields near *Gravesend*'. There are only a handful of other historic records. Daniel Cooper included the species amongst plants seen in gravel-pits at the back of Castle Wood, Shooter's Hill (*Flora Metropolitana*, 1836). .There is also a record in a list of plants seen by William Pamplin at the '*Hills surrounding the lower Bell and overlooking Kits Cotty House, near Aylesford'* published by Matthew Cowell in *A Floral Guide for East Kent etc.* (1839). It was collected by Edward Edwards at Shorne in 1843 (specimen in Manchester Museum); and Messrs. C.W. and H.N. Ridley contributed a record from Cobham to Hanbury & Marshall's *Flora of Kent* (1899).

Discounting a 1938 specimen from East Peckham in **MNE** (probably cultivated), there are only two modern localities for the plant in Kent.

The first of these is on the eroded chalk of the downland scarp at Cherry Garden Hill, Folkestone (probably TR2937). This appears to have been first found by Vera Day in June 1951, recorded as at Folkestone water-works. Francis Rose saw it in June and July 1954, and found it still to be locally abundant in June 1986. Whilst it was seen by Joyce Pitt in the 1990s and noted by Eric Philp at some time during 1991-98 for publication in Philp (2010), since then the open character of the terrain has declined, and there appear to be no recent records. Search in 2013 found the area heavily scrubbed over; some clearance has since been carried out, but search in 2015 did not reveal that it had returned. It is possible that the earlier presence of the species here had an origin from cultivation, when the Cherry Garden area was occupied and tended. Phil Green (personal communication) points out the coincidence of this historic usage, reflected in the continued presence of garden spring bulbs in the vicinity, coupled with the absence of Candytuft records on the neighbouring downs away from vicinity of former dwelling sites.

The second site was discovered by Geoffrey Kitchener in June 1995, on a bare chalk slope below rabbit burrows in Holborough Quarry, recorded as at TQ76B but, as far as can be interpreted against changes in the landscape, this was around TQ 700 627. Eric Philp subsequently (but before 1999) also found it at TQ66W in the same quarry; and the last sighting at TQ76B appears to have been by him and Doug Grant in July 2001. This eastern part of the quarry was sold off for housing and is now the Holborough Lakes development. The location is now no longer suitable for the species, although it is just possible that some residual terrain exists, a chalk cliff inaccessible behind security fencing or on neighbouring operational (but unused) quarry land.

Iberis amara is (normally) an annual and is fairly intolerant of competition, favouring bare ground accordingly. It appears to flourish on the well-drained substrate on steep slopes, as with the Kent sightings at Deal, Kit's Coty, Folkestone and Holborough. All these sites are on chalk, although the historic Shooter's Hill gravel-pit site suggests that it is not necessary for the habitat to be both well-drained and calcareous. There appears to be an association with rabbits, Showler (1994)[325] mentioning the presence of the plants at rabbit scratchings. One might suppose that this could in some cases relate to the disturbance required to provide bare ground for annual germination; but the Holborough site below rabbit burrows constituted bare ground without apparent need for intervention by rabbits. Showler (1994) also refers to the seed being long-lived and responding to vegetation removal and ground disturbance, so there may yet be scope for the Folkestone population to re-appear.



***Iberis amara* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The recent West Kent find on the distribution map is not a wild occurrence, but a casual escape from a garden at Eynsford (TQ5365) where sown.

Iberis amara is capable of being confused with the perennial *Iberis umbellata* (Garden Candytuft), also a plant found on disturbed ground, but as a garden escape. They are separated by annual Wild Candytuft having an inflorescence which lengthens when in fruit; also its fruits are smaller (most or all 3–6mm, in contrast with 7–10mm for Garden Candytuft). *Iberis amara*, however, has also long been grown as a garden plant.

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[325] Showler, A.J. (1994), *Iberis amara* L. in eds. Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain,* JNCC.

Isolepis cernua (Vahl) Roem. & Schult. (Slender Club-rush)

vc 15

Rarity / scarcity status:

Slender Club-rush is a generally coastal plant in the British Isles, frequent in Ireland and western Britain, extending eastwards to the New Forest where it is locally common, with an outlier in Norfolk. Its conservation status in both England and Great Britain as a whole is accordingly of 'Least Concern'. Its presence at only three locations in a fairly local part of East Kent has only been recognised recently and its county status is **rare**. It is a Kent axiophyte and so is indicative of good habitat.

Account:

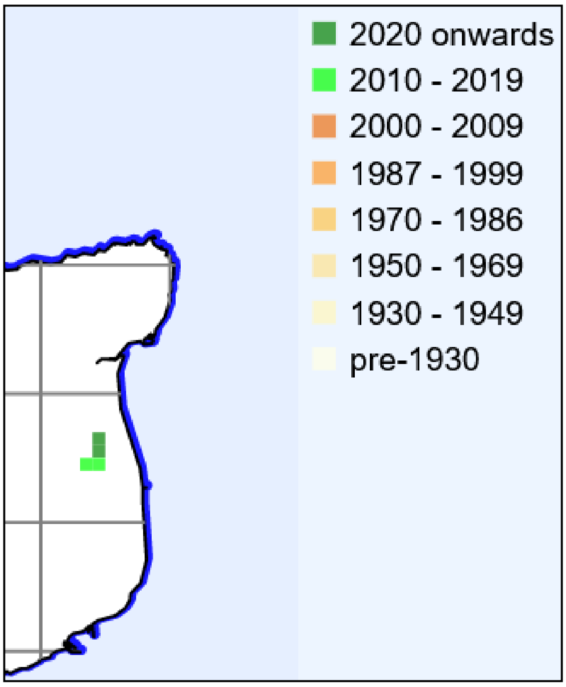
Isolepis cernua does not feature as a Kent plant in Hanbury & Marshall (1899) and was unknown to Francis Rose in the county, although he noted that it formerly occurred in Surrey and might yet exist in the littoral marshes in Pas de Calais. It is surprising, therefore, that there is mention in John Parkinson's *Theatrum Botanicum* (1640) of what appears to be this species (under the name *Gramen Junceum maritimum exile Plimostii*), said to be at both Plymouth and Dover 'in their wet grounds'. If this is correct, then presumably the habitat was in marshy ground associated with the valley of the River Dour. In terms of modern records, according to Philp (2010), *Isolepis cernua* was first found in Kent by James Cadbury on 5 September 2006, a single plant at Worth Minnis. This led to a check of all herbarium specimens labelled as the very similar species, *I. setacea*, including specimens from Worth Minnis, but all proved to have been correctly named.

Worth, habitat. Photo by Geoffrey Kitchener, 5 September 2013

Not widely known at the time was the listing of this species in a related ditch system, in the course of the Hacklinge Ditch Survey of 2003. The location was explored in 2011 by Bob Gomes, who came across a single tussock, from which verification by way of a smooth nutlet was derived. A more extensive assessment of the presence of the species was undertaken in 2013 by Bob Gomes, Lliam Rooney and Geoffrey Kitchener. It was found that the pastureland south west of Great Wood at Worth was dissected by several internal ditches, open to access by cattle from both sides (unlike the boundary ditches, which were in part protected from grazing by electric fencing, albeit that it was the boundary ditches which appear to have been covered by the 2003 survey). Slender Club-rush was found to be well distributed along these internal ditches.

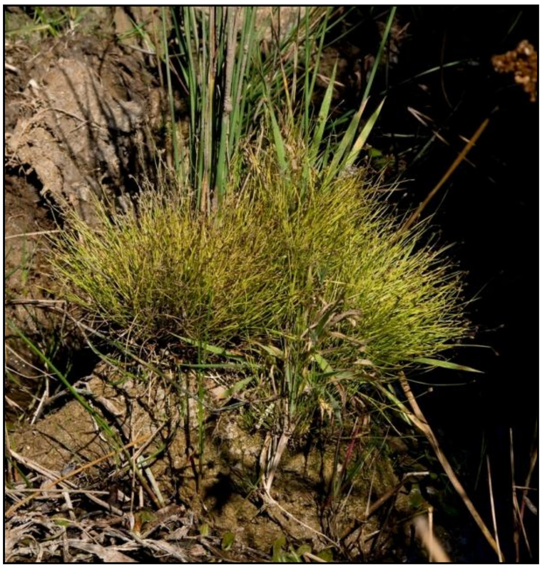
Isolepis cernua grew on the muddy tussocks created by cattle trampling down ditch margins, sometimes growing in isolation, otherwise generally with *Juncus* spp. Other species of interest in the vicinity included: *Baldellia ranunculoides* (Lesser Water-plantain), *Juncus subnodulosus* (Blunt-flowered Rush), *Oenanthe lachenalii* (Parsley Water-dropwort) and *Utricularia vulgaris* in the strict sense (Greater Bladderwort). The southern ditch consists of two arms, joining at right angles, and Slender Club-rush was frequent along both. The northern ditch held less Slender Club-rush, but this appeared to be a consequence of being steep-sided for part of its length so as not to provide the cattle-trampled marginal habitat which the species favoured elsewhere. Accordingly, the continued presence of the species was considered likely to be sensitive to ditch maintenance activities and the continuation of cattle grazing so as to provide the open muddy ground for establishment from seed. The site was significantly altered in 2019 by the construction of a bird scrape, and the absence of early/mid-year grazing while the ground settled. Plentiful *I. cernua* was still found in July 2020 in part of its earlier territory but the remainder of the ditch, where plants had been seen before, was mostly choked up with *Juncus subnodulosus* (blunt-flowered rush). The RSPB re-introduced cattle later, so that requisite poaching of wet ground appears to have been restored, and improvement of the ditch line in sections was planned (2020); *I. cernua* continues to be found (2022 at the margins of the bird scrape).

Isolepis cernua **Kent records to 2024 mapped at tetrad level, from BSBI database**



A second site, 1.5km to the south, was found by Stephen Lemon in August 2016. This was near Hacklinge, TR 34058 54243. One fruiting patch was seen growing in a damp, closely grazed sward of marshy, sedge-rich fen pasture in the Ham valley. Associated species included *Hydrocotyle vulgaris* (Marsh Pennywort) and *Calliergonella cuspidata* (Pointed Spear-moss). It was not seen along the muddy poached edge of a nearby dyke, which would have afforded habitat similar to that at the Worth site.

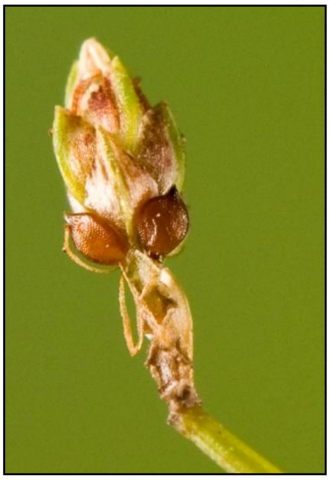
The third site is part of Ham Fen KWT reserve, in the same general area as the others, and was discovered as two elements, part by Stephen Lemon in June 2018 and part by a KBRG meeting in July 2018. At the latter find location there was a colony of at least 40 plants, with one outlying specimen, in the cattle-trampled ground alongside a fen pasture ditch. Associated species included *Anagallis tenella* (Bog Pimpernel), *Carex distans* (Distant Sedge), *Juncus articulatus* (Jointed Rush), *Phragmites australis* (Common Reed), *Ranunculus flammula* (Lesser Spearwort), *Triglochin palustris* (Marsh Arrowgrass). Three of these are rare plant register species, an indicator of the quality of habitat, although the presence of young *Phragmites* suggests that continued grazing and trampling is necessary to keep this at bay.



Worth. Photo by Bob Gomes, 5 September 2013

The species is inconspicuous, showing up only as small light green or yellowish-green tufts or patches at the base of other ditch vegetation, and could easily have been overlooked as a native of long standing in this area. If a means of introduction is to be sought, in view of the distance of these locations from other populations, then there is no obvious vector, other than birds. The species is known horticulturally, as a plant for bog gardens and pond edges, sometimes under the name of fibre-optic grass. However, whilst there is a public footpath in the vicinity of the Worth site, there is no public access through the fields at Worth and Hacklinge where it grows, and the Ham KWT reserve is not generally accessible, so the deliberate planting or abandonment of the species at any of these locations seems implausible. Other British occurrences tend to be in the vicinity of the coast, and the Worth, Hacklinge and Ham sites are located only 2.6, 3.4 and 3.5 km respectively from the sea.

It is a tufted annual or short-lived perennial and so presumably dependent on semi-open habitat being sustained or created for its continued recruitment.



Worth. Spikelet showing unridged nuts. Photo by Bob Gomes, 5 September 2013

Isolepis cernua is most readily seen by virtue of its bright green colour, but it needs to be distinguished from its relative*, I. setacea*, which is occasional in Kent in damp areas on heaths, woodland rides and at pond margins. The most obvious distinction is that the bract of *I. cernua* is usually shorter than the inflorescence, where in *I. setacea* it overtops. But this is not conclusive, and not all the *Isolepis* at Worth and Ham bore shorter bracts. The surface of the nuts is, however, diagnostic and it is smooth in the case of the Slender Club-rush, rather than ridged as with *I. setacea*.

Ham, habitat.
Photo by Geoffrey Kitchener,
21 July 2018

Site	Grid reference	Site status	Last record date	Recorder	Comments
Ham Fen	TR3354	SSSI, KWT reserve	(1) 21 July 2018 (2) 17 June 2018	(1) KBRG / KFC meeting (2) SL	(1) Ham Fen. At least 40 clumps of plants in an area of cattle-poached peat at TR 3379 5444. Associated flora included *Lysimachia tenella, Juncus articulatus, Ranunculus flammula* and *Triglochin palustris* (2) Hacklinge, west side of A258 (Ham Fen KWT), flooded ditch, cattle poached bare ground along south side (Unit 53: Ham Fen Fields), TR 33819 54463: one patch, another two nearby, TR 33805 54450: approximately 30+ patches some large.
Worth	TR3455, TR3456	SSSI, RSPB reserve from c.2019	(1) 13 July 2022 (2) 22 June 2021 (3) 3 July 2020 (4) 5 September 2013 (5) 30 June 2011 (6) 5 September 2006 (7) 2003	(1) SB (2) SB & SL (3) SB (4) RG, LR & GK (5) RG (6) CJC (7) CEC	(1) Five small patches have appeared at TR 3426 5576, on the cattle-poached margin of a bird pool dug 3/4 years ago. (2) (a) Lydden Valley, Worth Minnis RSPB (Compartment 45), a small amount alongside ditch along the northern edge of Great Wood, TR 3422 5617. One large plant on the cattle poached edge of the ditch. (b) Small field along the edge of the public footpath, TR 3430 5573. Many tufts at the edge of the unmanaged ditch along the eastern

					side of the field. (3) Plentiful plants seen at TR 3430 5573 and TR 3428 5576.but the remainder of the ditch (where plants had been seen previously) mostly choked up with *Juncus subnodulosus* and no grazing (at that date) to provide required poached conditions. [Grazing restored in September and with RSPB ditch improvement to follow.] (4) Found along ditches in pasture (i.e. both sides of ditches accessible to cattle) south west of Great Wood, Worth. Growing on muddy tussocks where margin poached, either in isolation or amidst *Juncus* spp. Seen at TR 34294 55750 (3 plants and another 3m away), TR 34283 55767 (1 plant and another 4m away), TR 34278 55772 (many plants), TR 34272 55781 extending to TR 34268 55791 (several plants), TR 34236 55834, TR 34216 55826 (several plants), TR 34196 55807 and for at least 10m westwards (many plants). And along a deeper ditch further north, TR 34137 55947 (2 plants), with further records in adjoining monad, TR3456. These were, at TR 34184 56003 and for 15m further north east, and at TR 34218 56040 (several plants). (5) TR 3426 5579, growing in a shallow, senescent ditch crossing a grazing marsh field west of the Great Wood at Worth Minnis. The bottom of the ditch held some shallow water and was in places poached by cattle that were grazing the field at the time. (6) Location as TR35M (7) TR 34071 55864 (ditch 121) and TR 34236 55675 (ditch 119).
Hacklinge	TR3454	SSSI (unit 56)	13 August 2016	SL	Cattle-grazed, marshy, sedge-rich fen pasture in Ham valley, on west side of A258 south of Hacklinge Farm; area south of the dividing dyke, TR 34058 54243. One fruiting patch in damp closely grazed sward by dyke, with *Hydrocotyle vulgaris* and *Calliergonella cuspidata*. Searched for but not found along muddy poached edge of dyke.

Jacobaea aquatica (Hill) P. Gaertn., B. Mey & Scherb. (*Senecio aquaticus* Hill.) (Marsh Ragwort)

vc 15 and 16

Rarity / scarcity status

Jacobaea aquatica is a plant of marshes and damp meadows across much of the British Isles, but much less frequent in the east. Its threat status for conservation purposes is regarded as of 'Least Concern' in Great Britain as a whole. In England, it is **Near Threatened**, as a comparison of its area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 24% in the likelihood of recording the species. There appears to have been a greater decline in Kent – indeed, at 64% between 1971-80 and 2010-23 the position could be regarded as catastrophic; and the species is now **scarce** in the county. It is a Kent axiophyte and so is indicative of good habitat.

Stodmarsh, habitat. Photo by Lliam Rooney, 11 July 2015

Account

The first published record for Marsh Ragwort in Kent is by Edward Jacob in his *Plantae Favershamienses* (1777): '*In the* Brents – *common*' (this was low-lying land adjoining Faversham Creek). Hanbury & Marshall (1899) regarded it as so common that this was the only record they gave. The only area where they did not know it was north west Kent, where, in any event, 'it doubtless grows'. Other early Flora writers tended not to mention it, unless they were covering common plants, as did Thomas Forster in his *Flora Tonbrigensis* (1816) in which he described Marsh Ragwort as 'In wet marshy places every where'. Francis Rose considered it to be locally common in wet meadows on peat and alluvium; frequent in meadows of the Thames, lower Medway, Darent and the lower Stour marshes, but sparsely scattered elsewhere and absent from wide areas although recorded for 22 hectads in the county. With the drainage of its habitats, it became scarcer, and Philp (1982) recorded it in only 15 hectads (equivalent to 35 tetrads), at the edge of streams, in marshes and in wet meadows. Its core distribution was then in West Kent, from Sevenoaks southwards to the border with east Sussex; otherwise, there was just a scattering in the Weald, the East Stour catchment, the Little Stour and near Sandwich.

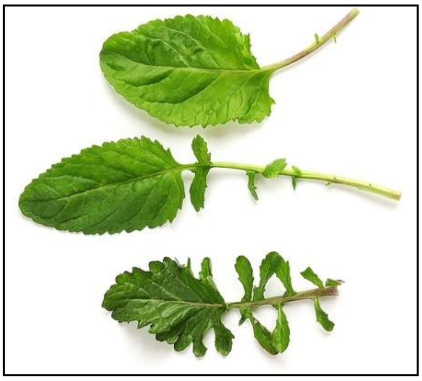
This local and scarce distribution had, by the time of Philp (2010) become very scarce, with four tetrad records only: near Cowden, Sevenoaks and Westbere. Our 2010-24 records amount to eight tetrads (12 monads) and differ from those of 1991-2005, except for Westbere. This last site, with Newnham Valley and Stodmarsh, provides a Kent focus for the species in the catchments of the Great and Little Stour rivers. Not only has the plant been found in thousands in wet grazing land by the Stour; but there is also a large number of records revealed by a survey of ditches in the Stodmarsh SSSI in 2022.

Other locations are at Foots Cray, Whitley Forest, Brasted (which appears to be a re-find of a 1950s record) and Tubbs Hole, between Penshurst and Fordcombe. Dungeness has also provided a sighting, for which further confirmation would be useful. While continued habitat loss in Kent may have taken place, with drainage works, it seems appropriate to seek further causes for this marked decline since 1980. Some losses may be due to herbicide controls, as with *Jacobaea vulgaris* (Common Ragwort) in grazing fields (and perhaps confusing one species with the other, although both are toxic to livestock). Also, the inability to re-find at Cowden appears to be due to an increase in scrub and tree cover coupled with a lack of grazing, and Tubbs Hole is also heading in that direction. There may also be aspects of climate change, given that its limited distribution in east England suggests that lower rainfall will be detrimental.

Stodmarsh. Photos by Lliam Rooney, 11 July 2015

Marsh Ragwort is a biennial, germinating rapidly from seed, especially when exposed to light, but apparently favouring a period of seed burial of at least one or two years as cold/wet stratification[326]. This suggests an ability, via a persistent seed-bank, to take advantage of gaps in grassland which may take place through mowing or grazing.

While Common Ragwort normally occupies drier ground than Marsh Ragwort, where they meet hybrids may arise (*Jacobaea* x *ostenfeldii*). They should have an intermediate degree of leaf dissection and inflorescence branching, minutely pubescent disc flower achenes (less dense than that of Common Ragwort), low fertility and more numerous flowers (e.g. over 90) than Common Ragwort. The cross was recorded in 2024 at the edge of *a J. aquatica* colony at Whitley Forest.



From Stodmarsh, lower leaves showing large end-lobes and degree of dissection. Photo by Lliam Rooney, 14 July 2015

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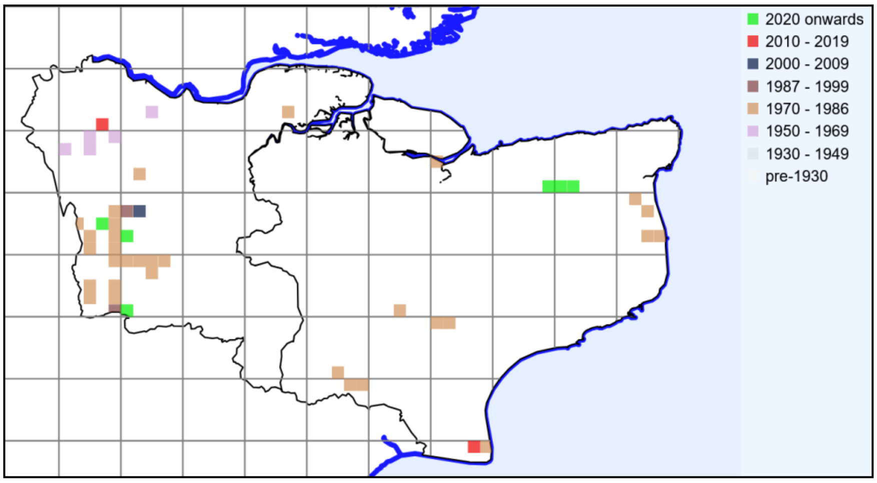
[326] Suter, M. & Lüscher, A. (2012). Rapid and high seed germination and large soil seed bank of *Senecio aquaticus* in managed grassland. *The Scientific World Journal* **2012**: 723808.



***Jacobaea aquatica* Kent records to 2024 mapped at tetrad level, from BSBI database.**

In view of the number of tetrad records (35) for 1971-80 in Philp (1982), only records for 1981 onwards are given in the following table. An overview of the numerous locations where the species has not been found since 1981 is provided by the accompanying distribution map.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Brasted	TQ4655		8 August 2020	GK	In series of fields north of R. Darent and west of Church Rd. Affected by farmer having herbicided in Nov 2019 to clear rushes, resulting in dominance of *Persicaria maculosa* and absence of *Jacobaea aquatica* from the treated areas. Instead, S *Jacobaea aquatica* was found in untreated damp, generally marginal areas. Plants were found lightly scattered from the gate at TQ 46858 55177 to the ditch/hedge field boundary at TQ 46773 55155, with a focus around a north-south stream at TQ 4680 5517. This scatter continued in the next field to the west, both near the Darent and along the west side of the ditch/hedge boundary, total in this field of 22 plants. Further west was a small untreated corner field, cut off by ditches, with single plants at TQ 46654 55138 and TQ 46612 55159. Associated spp. in first field included *Apium nodiflorum*, *Cirsium arvense*, *Cirsium palustre*, *Epilobium parviflorum*, *Glyceria notata*, *Holcus lanatus*, *Juncus inflexus*, *Lolium perenne*, *Mentha aquatica*, *Ranunculus repens*, *Rumex conglomeratus*, *Rumex sanguineus*, *Salix* x *fragilis* sens. Lat., *Scrophularia auriculata*, *Solanum dulcamara*, *Urtica dioica*. Francis Rose's MS *Flora of Kent* has a (1950s?) report west of Brasted, very abundant.
Cowden Meadow	TQ4741	SSSI	12 June 1982	JP	c. TQ 479 415. [not seen, June 2020, GK & August 2020, SL; site is scrubbing over.]
Bassett's Mill	TQ44V		1991-98	EGP	
Foots Cray	TQ4770		30 June 2010	RMB	Hales Field, several plants in centre

					of site TQ 47491 70528. Hales Field is horse-pasture by the River Cray across the A20 from Ruxley Lakes.
Chiddingstone Hoath	TQ5141		(1) 16 August 2020 (2) 1989	(1) SL (2) JP	(1) Tubs Hole, TQ 5168 4154. Flushed ground in a small open area, once part of larger open field, on the south facing slope above a stream, now almost completely scrubbed over. Two seeding plants. (2) TQ 517 415, Tubbs Hole Pastures.
Whitley Forest	TQ5052		1 July 2023	GK	TQ 5017 5249, one plant on bank by sloping forest ride, not particularly damp. Assumed seeded from TQ5053 colony.
Whitley Forest	TQ5053		(1) 18 Augyust 2024 (2) 19 August 2023 (3) 15 August 2020 (4) 1 June 2020	(1) & (2) GK (3) SL (4) GK	(1) From TQ 5080 5315 to c. TQ 5076 5308, still numerous in damp valley. At each end of the colony, *J. aquatica* was replaced by *J. vulgaris.* Material taken from a potentially hybrid plant within the colony at the north end showing high dissection of the leaves had fruiting capitula 8mm across, a sample one containing 80 flowers, apparently irregular achene development, with a well-formed one being fairly pubescent. (2) TQ 5077 5309 near spring and in both directions along related valley, damp part-shade, more numerous than when seen in 2020. (3) Spring Hill, Whitley Forest, TQ 5077 5307 / TQ 5082 5318 / TQ 5083 5320. Scattered plants mostly in seed, on flushed, herb rich, open ground along edge of the public footpath opposite the spring and along the edge of the stream (former mill pond). Preferring ground where vegetation not dense. (4) TQ 5077 5308, scattered along floor of stream valley on Hythe Formation from spring northwards for 50m, some outlying plants further north. Associated spp included *Veronica beccabunga*, *Carex remota.*
Riverhead	TQ55D		1991-99	EGP	
North Sevenoaks	TQ55I	KWT-managed reserve	21 June 2004	EGP, PH	South-eastern inlet of east lake at wildlife reserve, two or three plants in sandy hollow at TQ 52840 56794 or TQ 52789 56754 (per PH). [Not found, August 2020, GK]
Lamberhurst Quarter	TR6438		15 June 1999	GB & JP	Old Swan Farm.
Westbere	TR1960	SSSI	(1) 22 July 2022 (2) 26 July 2021 (3) 24 June 2010 (4) 23 June 2010 (5 1991-98	(1) PW & DGS (2) CO (3) CO (4) CO (5) EGP	(1) TR 1974 6030, TR 1955 6014, TR 1963 6014, TR 1971 6016, TR 2001 6040, TR 1968 6009, TR 1982 6024. Higham Farm ditch survey. (2) Grazing marsh south side of River Stour. (3) (a) South of river on wet meadows as before TR 196 603 to TR 199 604, frequent. (b) Two plants on newly cleared wet scrub area north of river c. TR 197 605. (4) On south river bank, but mainly marsh/grazing meadows on south side of river TR 196 603 to TR 199 604

					(5) Given as TR19V only; assumed to be this monad.
Stodmarsh	TR2060	SSSI	(1) 28 July 2022 (2) 28 July 2022 (3) 22 July 2022 (4) 22 July 2022 (5) 26 July 2021 (6) 2 May 2016 (7) 11 July 2015 (8) 13 June 2015	(1) AL & KFS (2) AL, PW & KFS (3) PW & PGS (4) AL & KFS (5) CO (6) AL & TGCR (7) LR (8) CO	(1) TR 2008 6037, TR 2001 6040, TR 2011 6041, TR 2014 6038, TR 2021 6053. Higham Farm ditch survey. (2) TR 2074 6156, TR 2074 6156, .Hoplands Farm ditch survey (3) TR 2001 6040. Higham Farm ditch survey. (4) TR 2018 6035, TR 2024 6047, TR 2028 6051, TR 2035 6049, TR 2045 6055, TR 2048 6057. Higham Farm, ditch survey. (5) Grazing marsh south side of River Stour. (6) TR2060. (7) Thousands of plants from the south bank of the River Stour covering hundreds of square metres north of Greater Puckstone Farm in wet grazing meadows. (9) Plants on south side of river, continuing from TR1960.
Stodmarsh (Hoplands Farm)	TR2061		(1) 28 July 2022 (2) 28 July 2022 (3) 28 July 2022	(1) AL (2) AL & KFS (3) PW & KFS	(1) TR 2086 6142. Hoplands Farm, ditch survey. (2) TR 2081 6144, TR 2084 6151, TR 2085 6156, TR 2099 6164, Hoplands Farm, ditch survey. (3) TR 2086 6157, TR 2039 6134 Hoplands Farm ditch survey.
Stodmarsh	TR2161	SSSI	(1) 28 July 2022 (2) 2015 (3) June 1991	(1) AL, PW & KFS (2) AL (3) CD	(1) TR 2104 6156. Hoplands Farm ditch survey. (2) Rare by the river near the colliery, TR 211 617. (3) TR 2097 6122, TR 2117 6166.
Stodmarsh	TR2162	SSSI	June 1991	CD	TR 2185 6207.
Stodmarsh	TR2262	SSSI	June 1991	CD	TR 2224 6223.
Stodmarsh (north west of Preston)	TR2361	SSSI	(1) 20 September2022 (2) 1 September 2022	(1) KFS & DSG (2) PW, DGS & RT	(1) TR 2349 6192, Stodmarsh, ditch survey. (2) TR 2330 6193, Stodmarsh ditch survey
Lydden Valley	TR3653		1982	ACH	TR 36065 53160, ditch 523 in Hacklinge Ditch Survey.
Dungeness					[TR 068 199; records at Dungeness need verification.]

Jasione montana L. (Sheep's-bit)

vc 15 and 16

Rarity / scarcity status

Jasione montana is in the British Isles a locally common plant of acid ground, whose distribution is primarily western; its eastern distribution is largely related to the East Anglian, Surrey and Hampshire heaths. Whilst its conservation status in Great Britain as a whole is of 'Least Concern', in England it is considered to be **Vulnerable** to the risk of extinction. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 39% in the likelihood of recording the species, which may relate to losses of lowland heath habitat and to the growth of coarser vegetation following a decline in rabbit grazing. In Kent, except for an outlier near Sevenoaks, Sheep's-bit is confined to the Lydd/Dungeness area. On the strength of the data given in Philp (2010) it would be regarded as scarce; but from the number of records made since, it is, despite being very local, a little commoner than would warrant scarcity ranking. It is a Kent axiophyte, indicative of good habitat.

Long Ponds Dungeness. Photo by David Steere, 4 July 2015

Account

Jasione montana-type pollen has been identified from deposits formed around 1160-1250 in Muddymore Pit, Dungeness (TR 062 176) and presumably the species formed part of the surrounding shingle ridge flora[327]. In terms of conventional botanical publication, however, Sheep's-bit may have been first recorded in Kent by Thomas Johnson (*Iter Plantarum*, 1629); at any rate, Hanbury & Marshall (1899) thought that this was the case. However, Johnson gave the (then) name of Sheep's-bit, *Scabiosa montana minima*, but attributed its site to Chalkedale near Dartford, a former chalk-pit quarried for quick-lime. This is a quite inappropriate habitat, so that at best, all one can say (as Francis Rose noted in the 1972 edition of *Iter Plantarum*) is that Johnson would more likely have seen *Scabiosa columbaria* (Small Scabious); and that, if he saw Sheep's-bit, he must have confused this record with one made at his next port of call, Dartford Heath, where it was known by de Crespingy before 1899. If Johnson's record is disregarded, the earliest publication was in 1763 by Thomas Martyn (*Plantae Cantabrigienses*), who listed it for Bexley. This would have been part of a pattern of occurrences on the acid soils of north west Kent: Hanbury & Marshall (1899) also list records from Blackheath, Lock's Bottom, Bromley Common, Lee, Charlton, Hayes Common and east of Plumstead Common. All these sites have gone, the last probably being a south-facing sandy railway cutting just west of Bromley South station, from where it was collected by Francis Rose in 1946 (specimen in **MNE**) and where it was still flourishing in 2002 (Rodney Burton, personal communication).

Hanbury & Marshall (1899) regarded the species as locally plentiful on sandy soils of banks and heaths, listing sites including Dunkirk; Sandwich; Tunbridge Wells and Rusthall Commons (where it was plentiful in Thomas Forster's day (*Flora Tonbrigensis*, 1816); along the Folkestone or Hythe Beds (Sevenoaks, Stone Street, Ightham Common, Addington, Leybourne, Bearsted); a scattering in the Weald (Hawkhurst, Staplehurst, Cranbrook); and in the Dungeness / Lydd / Dymchurch / Hythe / Sandgate area. Open heathland habitat has declined considerably in Kent since then, but some of this breadth of distribution still remained in the 1940s. As well as the Bromley record mentioned above, Francis Rose found Sheep's-bit three-quarters of a mile west of

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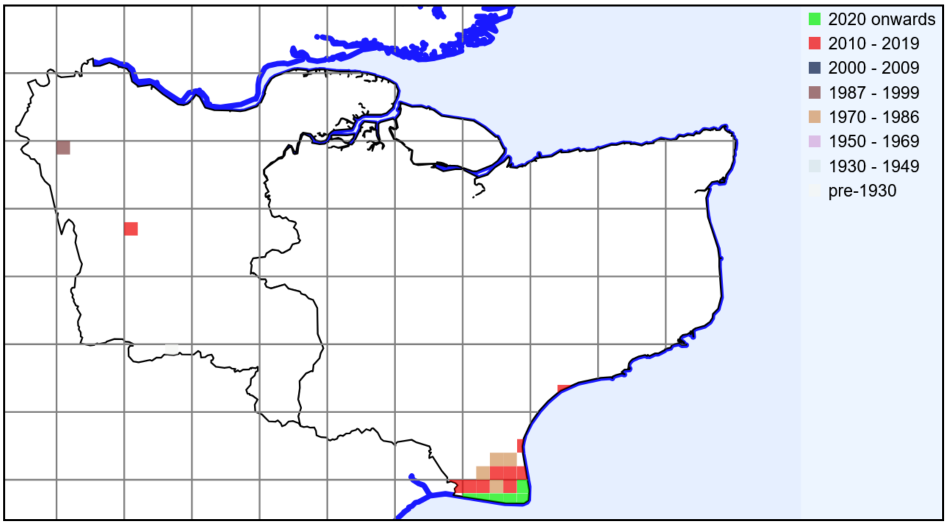
[327] Scofield, J.E. & Waller, M.P. (2005), A pollen analytical record for hemp retting at Dungeness Foreland, UK. *Journal of Archaeological Science* **32**: 715-726.

Wrotham Heath, in an old sand pit (Folkestone Sands) north of the railway in 1942 and 1946. He also collected from Friezley Wood, Cranbrook, by the sandy bank of a track in the wood in 1949, as well as at Dungeness, where it still subsists.



***Jasione montana* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The distribution had shrunk further by 1971-80, and Philp (1982) assessed the species as very local and scarce: 'Still common in the Lydd-Dungeness area but appears just about to have disappeared from its former inland localities'. Presence was recorded in 16 tetrads, including one inland site, at Riverhead (Sevenoaks). By 1991-2005, the inland site remained, but nearly 50% of the Lydd-Dungeness tetrads were without record, giving a total for the county of nine tetrads. Recording for the period 2010-24 indicates that the extent of loss may be overstated by Philp (2010), as the species has been found in 16 tetrads (27 monads). Accordingly, it is unclear whether there has been a decline in real terms from the 1970s.

Riverhead, former sand pit. Photo by Geoffrey Kitchener, 19 July 2016

Jasione montana is normally a biennial, overwintering as a rosette and flowering/setting seed within a year of germination. It occurs as isolated plants at varying levels of density on open ground. It appears to respond to higher rainfall levels than are usual in Kent (and hence is a more westerly distributed plant in the British Isles), but is intolerant of waterlogging. Weather patterns may affect its frequency in any one year, as was observed in the Lade/Greatstone area in 2011. In the British Isles generally, it is said[328] to be found on consolidated sand dunes, on cliff tops, on maritime heath and in semi-natural sites such as walls, hedgebanks and roadverges.

Our Kent locations are largely related to maritime heath, at Dungeness; and our inland site at Riverhead may be regarded as semi-natural (although it is not clear whether other historic sites along the Folkestone Sands may be considered as similar). The Riverhead site is a former sand pit used as a recreation ground, partly scrubbed and wooded, and Sheep's-bit just hangs on in trodden ground above the former sand working face, where vegetative succession is slow, partly because of the minimal soil cover on the free-draining sand, but is increasingly threatening any open areas; also there is the odd plant on the steep working face itself. It has in addition been known from the sandy railway cutting on the other side of Shoreham Lane to the main site. Associated species at Riverhead include *Agrostis capillaris* (Common Bent), *Anthoxanthum odoratum* (Sweet

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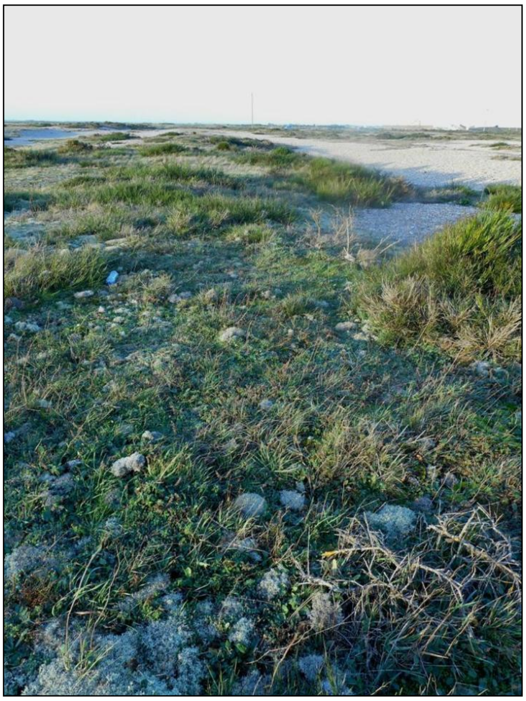
[328] Parnell, J.A.N. (1985), *Jasione montana* L., Biological Flora of the British Isles, *Journal of Ecology* **73**: 341-358. Some other general ecological information in this account is also taken from this source.

Vernal-grass), *Aira caryophyllea* (Silver Hair-grass), *Ulex europaeus* (Gorse), *Trifolium arvense* (Hare's-foot Clover), *Cytisus scoparius* (Broom), *Achillea millefolium* (Yarrow), *Hedera helix*, (Common Ivy). The Dungeness plants generally grow on the stabilised shingle with a very thin, acid, nutrient-poor, free-draining soil. Where noted, the flora is consistent with such a habitat, e.g. *Rumex acetosella* (Sheep's Sorrel) *Silene uniflora* (Sea Campion), *Teucrium scorodonia* (Wood Sage) and lichens (*Claydonia* spp.), but we could do with more data on associates.

Habitat, Littlestone. Photo by David Steere, 19 August 2015

Jasione montana, although somewhat scabious-like, is unlikely to be confused with other British species when in flower. There is some infraspecific variation in the British Isles: Sell & Murrell (*Flora of Great Britain and Ireland,* vol. 4) list five varieties, although no data as regards the occurrence of any in Kent can be traced, albeit that var. *montana* is the designation for anything which cannot be assigned to another variety.



Typical shingle ridge habitat, Dungeness. Photo by Owen Leyshon, December 2015

Site	Grid reference	Site status	Last record date	Recorder	Comments
Bromley south (metropolitan vc16)	TQ4068		14 August 1987	RMB	TQ 403 687, top of railway bank west of Bromley South station. Also seen by RMB making a good show in 2001 and 2001, but not since, in spite of looking out for it. The site is [2015] seriously overgrown with *Clematis vitalba* and brambles.
Riverhead	TQ5156		(1) 19 July 2016 (2) 20 July 2011 (3) 1991-99 (4) After 1970, before 1981 (5) 13 July 1978	(1) & (2) GK (3) EGP (Philp, 2010) (4) Philp (1982) (5) RMB	(1) TQ 516 561, one plant on hummock in steep face of former sand pit, on virtually bare sand. Associated spp. *Anthoxanthum odoratum, Agrostis capillaris, Aira caryophyllea, Ulex europaeus*. Also at TQ 51627 56165, a patch c. 1 sq metre, maybe 6-10 plants, skeletal soil on sand. Fairly open ground, but potentially invasive shrubs/trees beginning growth nearby. Associated spp. *Anthoxanthum odoratum, Aira caryophyllea, Ulex europaeus, Trifolium arvense, Cytisus scoparius, Achillea millefolium, Hedera helix, Quercus robur.* (2) TQ 51628 56142, a small patch on open sandy ground above former pit in Bradbourne Sandpits

					recreation ground. (Full search not made.) (3) & (4) Recorded as TQ55D. (5) Seen on railway cutting from train.
Dungeness: Jury's Gap	TQ9918		7 August 2012	OL, GK, TI & SB	
Dungeness, The Wicks	TR01D		30 May 1993	EGP & JBe	Relates either to TR0017 or TR0117.
Dungeness, the Wicks	TR0117		14 June 2024	AL	TR 0122 1769, Denge Beach. Flat shingle behind ridge.
Lydd Ranges	TR0018	MOD land, SSSI	7 August 2012	OL, GK, TI & SB	On shingle at TR 0011 1833.
Lydd Ranges	TR0118	MOD land, SSSI	(1) 9 August 2013 (2) 1 November 1977	(1) OL, GK & TI (2) CJ	(1) TR0181 (2) TR 018 180.
Lydd Ranges	TR0217		22 August 2024	AL & RD	Denge beach.
Dungeness, Lydd Ranges	TR0317	SSSI	(1) 22 August 2024 (2) 8 August 2012 (3) 30 May 1993	(1) AL & RD (2) SB & TI (3) EGP (Philp, 2010)	(1) Denge beach. (2) Shingle at TR 0392 1717. (3) Recorded as TR02I, so relates to TR0317 or TR217.
Lydd Ranges	TR0318	MOD land	28 April 2014	OL, Ti & SB	
Lydd Ranges	TR0319	MOD land, SSSI	7 August 2012	OL, GK, TI & SB	Sandy/shingly ground at TR 038 198 with *Teucrium scorodonia*.
Lydd Ranges	TR0417		(1) 22 August 2024 (2) 8 August 2012	(1) AL & RD (2) SB & TI	(1) Denge beach. (2) Present.
Lydd / Denge	TR01P		After 1970, before 1981	Philp (1982)	
Dungeness	TR0516		9 August 2012	TI	
West Lydd	TR02F		After 1970, before 1981	Philp (1982)	
Lydd north east	TR0521	SSSI	(1) 27 June 2012 (2) 15 July 1999 (2) 7 August 1986	(1) OL (2) JP (3) FR	(1) TR0521. (2) TR 0509 2180. (3) Abundant.
Dungeness power station	TR0616	SSSI, NNR	(1) 15 September 2017 (2) 20 August 2011	(1) BBe (2) SB	(1) TR 0606 1684, Dengemarsh, a few plants. (2) Abundant on shingle TR 0699 1687.
Dungeness power station	TR0716		(1) 20 August 2024 (2) 22 June 2014	(1) AL & RD (2) KBRG meeting	(1) Denge beach.
Dungeness power station	TR0717	SSSI, NNR	(1) 22 June 2014 (2) 20 June 2000	(1) KBRG meeting (2) JS	(1) TR0717. (2) TR 079 177.
Dungeness reserve	TR0718	RSPB reserve, SSSI	(1) 2 June 2018 (2) 4 July 2015 (3) 3 July 2011	(1) SL (2) DS (3) TI	(1) Dungeness RSPB Reserve, shingle ridge between Open Pit 1 and Open Pit 2, TR 074 181. Square metre dominated by colony of flowering plants. (2) TR 07866 18986, over 100 plants, more flowering than in 2014, over area to north of Long Ponds. (3) TR0718.
Dungeness, north of Denge beach	TR0719	SSSI	(1) 4 October 2013 (2) 3 July 2011	(1) DS (2) TI	(1) TR 078 190, near layby for anglers, Long Pits, over 20 plants in shingle vegetation. (2) TR0719.
Greatstone south west	TR0721	SSSI	July 2017	CFB	TR 07413 21710, a few plants on partially 'degraded' shingle 'tongue'. Countryside stewardship monitoring.
Dungeness, old lighthouse	TR0816	SSSI, NNR	(1) 26 June 2022 (2) 17 July 2021 (3) 6 September 2020 (4) 3 July 2011 (5) 23 June 2010 (6) 21 June 2008	(1) KBRG / WFS meeting (2) DS (3) GK (4) TI (5) SB (6) DM	(1) TR 08724 16900. (2) Over a hundred flowering plants between the old lighthouse parking area and seaward side of the power station. (3) Occasional, some still flowering, in lichen and moss layer over shingle. (4) TR0816. (5) TR 08742 16913, 12 plants on

					stabilised shingle. (6) TR0816.
Dungeness, north of old lighthouse	TR0817	SSSI, NNR	(1) 26 June 2022 (2) 14 June 2020 (3) 13 August 2016 (4) 8 June 2004	(1) KBRG / WFS meeting (2) SL (3) DS (4) JP	(1) TR0817. (2) Dungeness, Denge Beach, between the Old Coastguard Cottages and the Open Pits. Flowering in abundance on undisturbed shingle west of power station approach road. (3) Dungeness, power station East. Small group of flowering plants in short turf, TR 08594 17040. (4) Behind old lighthouse, stated as TR 085 175.
Dungeness, Long Pits	TR0818	SSSI	(1) 23 August 2021 (2) 23 August 2013 (3) 3 July 2011	(1) AL (2) CO (3) TI	(1) Westview Cottage Dungeness TR 087 184. Frequent on the shingle. (2) Almost over. (3) TR0818.
Lade, Greatstone	TR0820, TR0821		(1) 22 August 2011 (2) After 1970, before 1981	(1) OL (2) Philp (1982)	(1) Found throughout the square from TR 081214 (west of the houses at Channon Road) south through TR 083208 to south of Pleasance Road North at TR 086201. All in flower at present and species appears to be more widespread in 2011 compared to recent years. Weather/rainfall is driving factor. (2) Recorded as TR02V.
Dungeness	TR0916		27 July 2014	JP	
Dungeness – lifeboat station	TR0918		3 July 2011	TI	
Hythe Ranges	TR1433	MOD land	(1) 29 June 2013 (2) 31 May2001 (3) 31 August 1995	(1) SB & OL (2) IB & JP (3) JP	(1) Frequent on scattered patches of undisturbed established shingle heath at TR 146 335 and TR 146 334, with *Cladonia* lichens, *Silene uniflora*, *Rumex acetosella*, etc. Population potentially at threat from vehicle disturbance. (2) & (3) TR 144 335.

Juncus acutus L. (Sharp Rush)

vc 15

Rarity / scarcity status

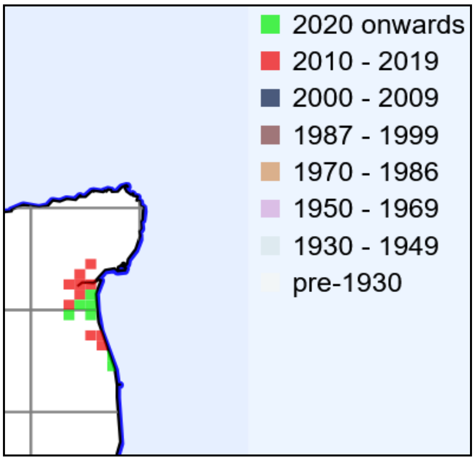
Juncus acutus is a plant of coastal sand and saltmarsh, very local in the south of the British Isles, principally on the Welsh coast and the eastern coast of Ireland. Its conservation status in England and in Great Britain as a whole is of 'Least Concern', but its limited distribution means that it is **nationally scarce**. It is also **scarce** in Kent. It is a Kent axiophyte, indicative of good habitat.

Sandwich. Photo by Lliam Rooney, 22 June 2010

Account

Hanbury & Marshall (1899) note that although the first printed record for Kent was thought to be in Turner and Dillwyn's *The Botanists's Guide through England and Wales* (1805) – in which it was recorded by Joseph Woods junior at Sand hills near Deal – they had found earlier mention in a manuscript by James Petiver and James Sherard. This was an account published in the *Phytologist* N.S. (1862) as the *Journal of a Botanical Journey from London to Dover, the Isle of Thanet, Rochester, etc., by Tunbridge and Hastings.* Petiver and Sherard, on 23 August 1714, walked from Knowlton Court to Deal and, sending their servant on ahead, continued for four or five miles to Sandwich, keeping near to the sea. On the sandy downs near Sandowne Castle, they met with 'Junc. capitulis, Sorghi' [*Juncus acutus*]. The species is mentioned amongst others which are characteristic of sand dunes, although the dunes or downs were also covered with broom, a great quantity of which they saw laid out on the beach to dry, to make 'Bas belts' (presumably bass, a term for plant fibres).

It is, however, quite possible that these records were anticipated by Thomas Johnson in 1632, when travelling from Margate to Sandwich. Francis Rose makes a case (in the 1972 translation of Johnson's *Descriptio Itineris*)[329] for his record of *Juncus major durior* as relating, not to *Juncus maritimus* (Sea Rush) – as Hanbury & Marshall (1899) had supposed – but at least in part to *Juncus acutus*. Johnson's journey would have taken him past where *Juncus acutus* has long been known, including a relict dune-slack at Ebbsfleet which appears to be pre-eighteenth century at least.



Juncus acutus **Kent records to 2024 mapped at monad level, from BSBI database.**

Sharp Rush was considered by Hanbury & Marshall (1899) to be very rare, on sandhills and in marshes near the sea. Records were limited to the Deal / Sandwich / Pegwell area; and a claim from Dungeness was discounted. This has remained the area of Kent distribution ever since. Philp (1982) and Philp (2010) give it here in eight tetrads, seven of which are identical. So far, recording in the period 2010-24 has produced records from ten tetrads (17 monads). The distribution accordingly appears at least fairly stable.

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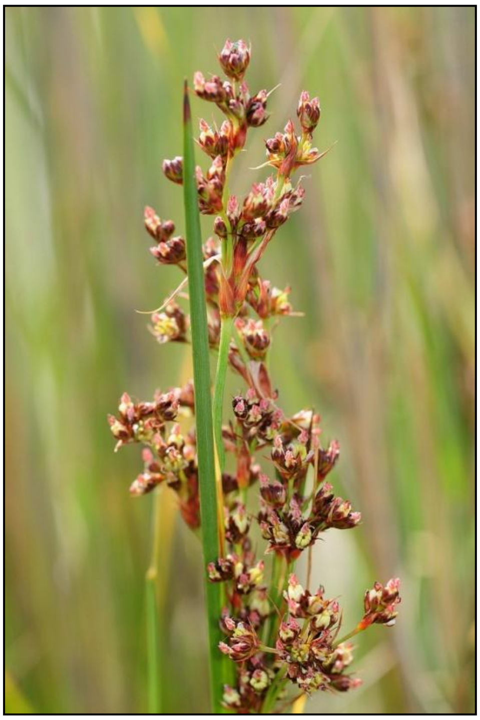
[329] Accepted in Pearman, D. (2017). *The Discovery of the Native Flora of Britain & Ireland*. Botanical Society of Britain and Ireland, Bristol.

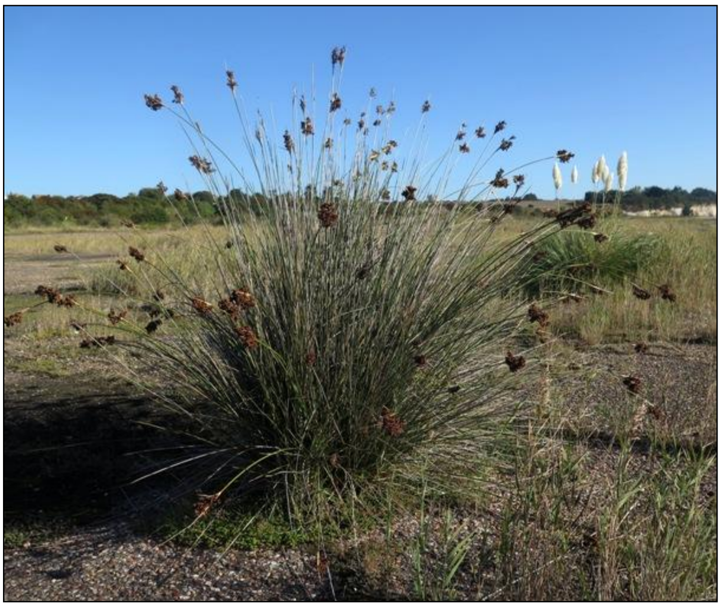
Its habitat in Kent has been noted as including the edge of dykes or ditches; wet sandy soil behind dunes; damp saline dune slacks or sandy brackish hollows; rough pasture or fixed dune grassland; and at Shellness it has been seen at the highest tide limit, some washed loose by storm surges. Whilst Sharp Rush grows in damp areas, it appears not to be so tolerant of permanent waterlogging as is *Juncus maritimus* (Sea Rush)[330]. Although the habitat is normally saline, Francis Rose observed that its Kent occurrences included older dunes which are no longer saline, but of a fen character, the soil being highly calcareous with much colloidal black peat in the top inch.



Sandwich. Photo by Lliam Rooney, 22 June 2010

In the marginal zone of the more saline slacks, where it may be locally abundant or even dominant, Francis Rose described its associates as including *Carex extensa* (Long-bracted Sedge), *Limonium binervosum* (Rock Sea-lavender), *Parapholis incurva* (Curved Hard-grass) and *Sagina maritima* (Sea Pearlwort). Where saline water levels are higher, and *Juncus acutus* is not found, one might expect to find *Juncus maritimus* (Sea Rush), *Juncus gerardii* (Saltmarsh Rush), *Spergularia marina* (Lesser Sea-spurrey) and *Triglochin maritima* (Sea Arrowgrass). In an older, non-saline slack he found Sharp Rush only sparse or locally frequent, and then associated with *Potentilla anserina* (Silverweed), *Parentucellia viscosa* (Yellow Bartsia), *Salix repens* (Creeping Willow) and *Juncus articulatus* (Jointed Rush). In drained or filled-in slacks modified by golf courses and buildings, Sharp Rush was found growing with *Ammophila arenaria* (Marram) and *Festuca arenaria* (Rush-leaved Fescue).

Juncus acutus generally grows as scattered plants, conspicuous through their size, but can become dominant over small areas. The size, toughness and dense prickliness of the tussocks render the species resistant to trampling, grazing and uprooting; and so plants may survive changes in land use. The tufted character means that the shortness of rhizome internodes inhibits spread where the movement of sand threatens to overwhelm a plant. The large tussocks may represent plants several decades old.



Pegwell Bay, old hoverport. Photo by Sue Buckingham, 23 September 2016

A large plant of *Juncus acutus* is unlikely to be confused with anything else. A smaller one may be confused with *Juncus maritimus* which, however, does not have so stiff and tufted a habit. *Juncus acutus* flowers earlier (June, rather than July to August) and its red-brown capsules are almost twice the length of the tepals (cf. light brown capsules of *Juncus maritimus*, about equal to the length of the tepals).

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[330] General ecological information is given by Jones, V. & Richards, P.W. (1954). *Juncus acutus*, L., Biological Flora of the British Isles, *Journal of Ecology* **42**: 639-650.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Lydden Valley	TR3354	SSSI	2003	CEC	TR 33836 54551, Hacklinge Ditch Survey.
Great Stonar	TR3359	SSSI	5 April 2022	SB	Several plants at the margin of a large water body at the foot of the River Stour flood barrier, TR 3392 5915
Stonar Cut	TR3360		(1) 13 October 2016 (2) 2 March 1983	(1) SB (2) ACH	(1) TR3360. (2) TR 337 608, saltmarsh, Stour estuary.
Stonar Cut	TR3361 TR36F		(1) 30 May 2002 (2) 1991-98	(1) JP (2) EGP (Philp, 2010)	(1) TR 3333 6101, Thanet waste Management Site; also given as TR 334 610. This site has since been developed. (2) Recorded as TQ36F and may relate to this monad.
Stonelees NR	TR3362		28 July 1999	FR	In big pit dug in 1988.
Lydden Valley	TR3452	SSSI	2003	CEC	TR 34545 52918, Hacklinge Ditch Survey.
Sandwich Bay	TR3458	SSSI	18 August 2007	JS	TR 349 587.
Lydden Valley	TR3460		(1) 16 June 2020 (2) 13 October 2016 (3) 2003	(1) & (2) SB (3) CEC	(1) Dune grassland. (2) - (3) TR 34830 60930, TR 34961 60043, Hacklinge Ditch Survey.
Sandwich Bay	TR3461	SSSI, local nature reserve	(1) 14 May 2011 (2) 2 March 1983	(1) SB (2) ACH	(1) Plants continuous along 200 metres of ditch from TR 3450 61519 to TR 34697 61635. (2) TR 343 614, TR 349 618.
Pegwell Bay	TR3462	SSSI	(1) 22 September 2015 (2) 2 March 1983	(1)KBRG meeting (2) ACH	(1) TQ3462. (2) TR 343 627.
Great Stonar	TR35J		After 1970, before 1981	Philp, 1982	
Cliffsend south	TR3463		20 September 2016	CO	On edge of saltmarsh by main road at TR 346 639
Sandwich Bay	TR3557	SSSI	(1) 3 June 2010 (2) 1982	(1) GK (2) ACH	(1) TR 3572 5764, one clump in rough pasture. (2) TR 35591 57640.
Sandwich Bay	TR3558	SSSI	(1) 2003 (2) 2 March 1983	(1) CEC (2) ACH	(1) TR 350315 8888 (2) TR 355 585, Royal St George's Golf links.
Sandwich Bay	TR3559	SSSI	(1) 26 May 2021 (2) 19 May 2020 (3) 9 July 2010 (4) 24 June 2010 (5) 29June 2008	(1) SB (2) SB (3) JA (4) SB (5) DM	(1) Old practice range. (2) Old dune slack between St George's and Prince's golf courses. (3) Eight clumps at TR 35386 59162. (4) TR 35391 59160, five large plants in a dune slack. (5) TR 3561 5965.
Sandwich Bay	TQ3560	SSSI, KWT reserve	(1) 6 August 2024 (2) 4 August 1996 (3) 2 March 1983	(1) AL & TH (2) FR (3) ACH	(1) TR 3524 6000. Wet hollow created as planning compensation. (2) (a) One clump in slacks by pool. (b) Abundant. (3) TR 353 605, Prince's Golf Links.
Sandwich Bay	TR3561	SSSI, KWT reserve	(1) 27 July 2022 (2) 8 July 2021 (3) 1 August 2015 (4) 9 June 2010 (5) 5 July 1987	(1) SB (2) SB (3) LR & SL (4) JA (5) EGP & RoF	(1) (a) A few clumps fringing pools on Prince's golf course at TR 3517 6137. (b) 3 clumps in pools on Prince's golf course at TR 352 610. (2) KWT reserve, in the brackish hollows. (3) South of Shellness, damp hollow, TR 35095 61816. (4) 200+ plants at TR 35039 61999. (5) TR 350 619.
Pegwell Bay	TR3562	SSSI	(1) 23 September 2015 (2) 15 April 2015	(1) KBRG meeting (2) SB	(1) Plants at the very highest tide limit at TR3 501 6257, some had been washed loose by storm

					surges.
Pegwell Bay	TQ3564		23 September 2016	SB	A single large fruiting plant on the concrete apron of the old hoverport TR 35068 64012. Ten seedlings from this plant within a few metres, one with an infructescence.
Lydden Valley	TR3654	SSSI	2003	CEC	TR 36626 54960, TR36496 54916, Hacklinge Ditch Survey.
Lydden Valley	TR3655	SSSI	2003	CEC	TR 36220 55380, TR 36482 55107, TR 36360 55039, TR 36373 55495, TR 36520 55600, TR 36532 55398, TR 36731 55427, Hacklinge Ditch Survey.
Sandwich Bay south	TR3656	SSSI	29 October 2011	SB	Two plants at TR 36545 56276.
Sandwich Bay estate	TR3657		1 August 2011	SB	
Stonelees	TR3662	KWT reserve, SSSI, NNR	(1) 2 July 2013 (2) 18 October 2011	(1) KBRG meeting (2) SB	(1) TR 3385 6249.
Deal – Sandown Castle	TR3754	SSSI	3 January 2011	SB	(a) TR 37211 54391, one plant at edge of golf course, opposite club house and other single plants nearby at TR 37187 54471, TR 37162 54659 and TR 37165 54684. (b) 27 plants in a hollow in fixed dune grassland at TR 37387 54341. Also 4 plants, edge of Royal Cinque Ports golf course at TR 37345 54321 plus (same grid reference) one plant fenced off with wood and wire. (c) One plant in fixed dune grassland at each of TR 37467 54403, TR 37440 54497, TR 37442 54490, TR 37387 54406. Also two and five respectively at TR 37378 54364 and TR 37375 54340. (d) TR 37145 54946, single plants in dune grassland. Also TR 37103 55002, single plant here and at TR 37090 55036. Also TR 37083 55051, three plants in grassland, edge of golf course.
Deal north	TR3755	SSSI	(1) 17 July 2020 (2) 3 January 2011 (3) 1997 (4) 2 March 1983	(1) & (2) SB (3) BB (4) ACH	(1) - (2) TR 37306 55089, landward side of shingle sea bank. Also approx 15 plants beside pond on edge of golf course (same grid reference given). (3) TR 372 552, brackish slack. (4) TR 376 557, Royal Cinque Ports Golf Links.

Juncus compressus Jacq. (Round-fruited Rush)

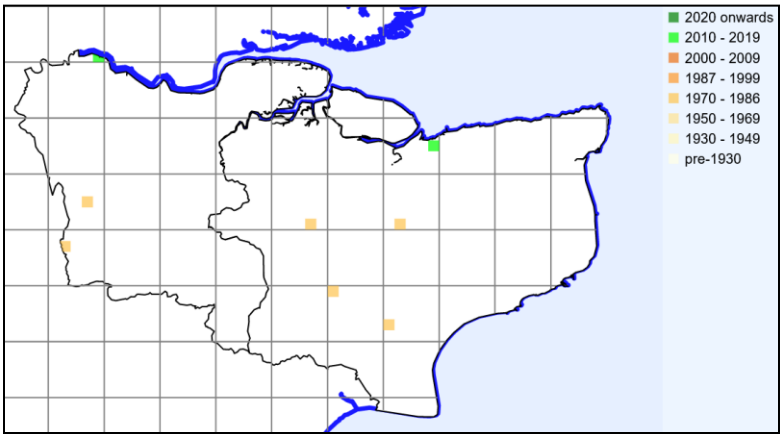
vc 15 and 16

Rarity / scarcity status

A plant of marshes and wet meadows, Round-fruited Rush is found in southern, central and north west England and scattered elsewhere in the British Isles. It is regarded **Vulnerable** to the risk of extinction in Great Britain as a whole; also in England, albeit more frequent there than in Wales, Scotland and Ireland, in all of which it is rare. The English assessment of Vulnerable is based on a reduction both in the overall geographical extent of its occurrence in England and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 37% and its area of occupancy had declined so that there was a 34% reduction in the likelihood of recording the species. There has been a substantial decline in Kent also, and its presence was reduced to six tetrads in the 1971-80 county survey and then it could not be found at all in the 1991-2005 survey. It survives, however, but is **rare** in Kent.

Account

Juncus compressus was first purportedly recorded in Kent by Thomas Forster in his *Flora Tonbrigensis* (1816) as growing 'On moist meadows and heaths'. It should not be supposed from this that it is a plant of acid ground; the reference to heaths is a little surprising and the record is questionable. Edward Jenner could not find it and marked the species in his *Flora of Tunbridge Wells*, 1845, as included solely on Forster's authority. Hanbury & Marshall (1899) considered it to be a scarce plant of marshy ground, with few, but widespread, records – some inland, but most fairly coastal. These records included Plumstead Marshes; a meadow near Herne Bay; a grassy flat by the shore near Whitstable; east of Sheerness; Pegwell Bay; Romney and Hythe/Dymchurch; and a cluster of records west of Ashford (Sevington, Stanford and near Stowting, apparently on the gault clay, a little below the chalk hills). The Stowting site (communicated to Hanbury and Marshall by William Beeby, who collected there in 1887) survived long enough for Francis Rose to collect the rush in 1947 and 1954, in a calcareous fen meadow below the village, by chalk springs. Analogous East Kent locations where Francis Rose found *Juncus compressus* were fen meadows at Wingham (1946) and Worth Minnis (1951); a calcareous spring in fen meadow at Cuckolds Coomb above Brook (1946 and 1950); and a wet, calcareous meadow on gault below chalk springs and south of Brabourne Church (1954). In West Kent[331], he found it in 1944 abundant at Halling Marshes; Cuxton; Upnor; Shorne Marshes; apparently replacing *Juncus gerardii* (Saltmarsh Rush) by the tidal Medway, where he had not seen the latter for certain. It is possible that he changed his mind about these last finds, as they were not included in his manuscript *Flora of Kent*, which carries no West Kent records.



***Juncus compressus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

These sites generally do not feature in Philp (1982), where the records are all inland, mostly relating to gault or Wealden clay. And even those sites could not be found in the surveys for Philp (2010), several having been destroyed by land drainage (although Francis Rose still found it to be locally frequent in 1986 at Cuckolds Coomb); so that it was then considered that the species might be extinct in the county. However, it was subsequently discovered at Seasalter Levels, a site which may bear a relationship to de Crespigny's pre-1895 record at a grassy flat near Whitstable. Also, it was recorded in 2015 by Rodney Burton at a scrape in Erith Marshes, West Kent, a site reminiscent of Thamesmead records (gone by1986) and historic Plumstead Marshes occurrences.

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[331] BEC report for 1943-44 (1946): **12**: 760.

Round-fruited Rush is a plant of weakly acid to weakly basic soils, in pasture, meadow or grassland, often in areas which rapidly dry out after inundation during winter and early spring[332]. The Seasalter Levels match this habitat description well. The Francis Rose East Kent descriptions largely seem to apply to habitats with soils more alkaline than weakly basic, although once calcareous flushing has reached gault clay, its effect may be diluted. Conditions for seed germination require localised disturbance to open the seed bank, and bare, moist soil for access to light and warmth. These conditions may be achieved under livestock grazing.

Seasalter Levels, habitat. Photo by Lliam Rooney, June 2013

Coastal locations, where water may be brackish, give rise to difficulty in picking out *Juncus compressus* from the very similar *Juncus gerardii* (Saltmarsh Rush), which is not confined to saltmarsh, so that their habitats may overlap outside.

The species are best not separated on one character alone. *J. compressus* is tufted, forming only small patches; *J. gerardii*, with its creeping rhizomes, tends to form larger patches. *J. compressus* has a curved, somewhat flattened stem; that of *J. gerardii* is stiffly erect and more three-angled. The lowest bract is usually shorter than the inflorescence in *J. compressus*; longer in *J. gerardii*. The near-globose capsule is 1½ times the size of the pale brown tepals in *J. compressus*; the capsule is oval and pointed, scarcely, if at all, longer than the very dark brown or blackish-edged tepals in *J. gerardii*. (Beware of different-shaped *J. gerardii* capsules leading to an expectation that the fuller ones must represent Round-fruited Rush: this may simply reflect the fact that some plants have set seed better than others.) The anthers of *J. compressus* (which may remain, tucked behind the tepals, after flowering) are 0.5-1mm long and up to twice the length of the filaments below; those of *J. gerardi*i are 1-2mm long and two to three times the length of the filaments. (These anther measurements are for fresh anthers; spent or dried ones may require wetting before examination.) The style of *J. compressus* is 0.1-0.3mm, less than half as long as the stigmas; that of *J. gerardii* is 0.5-0.8mm, about as long as the stigmas. The seeds of *J. compressus* are 0.35-0.5mm long; those of *J. gerardii* are 0.5-0.7(-0.85)mm. The anther, style and seed characters are regarded as the most diagnostic.

The hybrid between *J. compressus* and *J. gerardii* was claimed by J.E. Lousley in 1934 at Pegwell Bay (specimens in **SLBI**), where a patch of *Juncus* was observed between the putative parents, with intermediate leaf colour and a markedly infertile weakly general appearance[333]. The record was published subject to qualification, and is treated as unsatisfactory in the *Hybrid Flora of the British Isles*, as with all other British records[334].

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[332] Stroh, P.A. 2014. *Juncus compressus* Jacq.. Round-fruited Rush. Species Account. Botanical Society of Britain and Ireland.

[333] Lousley, J.E. (1935). Juncus compressus x Gerardi. *Rep. Bot. Soc. Exch. Club Brit. Isles* **10**: 986-987

[334] Stace, C.A., Preston, C.D. & Pearman, D.A. (2015). *Hybrid Flora of the British Isles*. Botanical Society of Britain & Ireland, Bristol. The position is further confirmed by Wilcox, M. (2015). Recording *Juncus gerardii* and *J. compressus*. *BSBI News* **130**: 57.

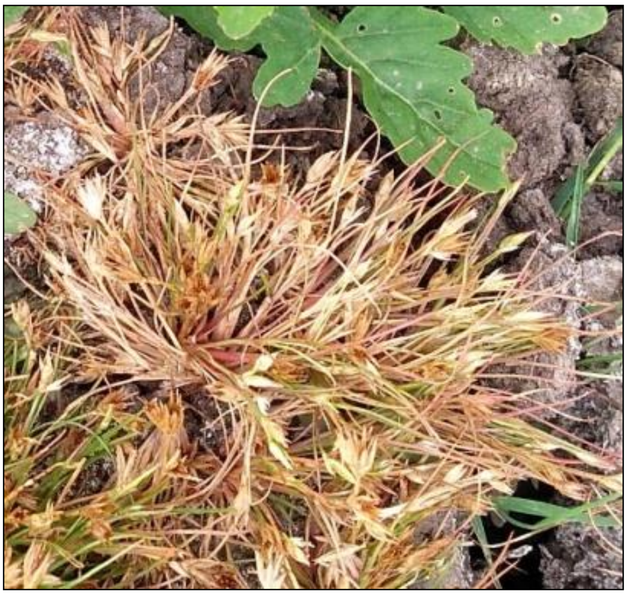
Site	Grid reference	Site status	Last record date	Recorder	Comments
Edenbridge	TQ44I		After 1970, before 1981	Philp (1982)	
Brasted	TQ45S		Summer 1972	RAC	By Marley Tile works, **MNE.** [Probably c. TQ 465 547, a sand pit since infilled and absorbed into golf course.]
Thamesmead West (metropolitan vc16)	TQ4580		(1) 6 August 1985 (1) 20 May 1984	(1) WFS meeting (2) BSBI meeting	(1) TQ 459 808, on west margin of the more northerly of the Twin Tumps, two oval canals. May have been only two plants. (2) Same site, said to have been almost inaccessible. This site became over-shaded by bushes (per RMB). Historic records for Plumstead Marshes may be relevant.
Cross Ness (metropolitan vc16)	TQ4781		8 May 1984	RMB and JCo	TQ 478 811, east of Crossways Lake. Four old clumps. Site destroyed in 1986 (per RMB).
Erith Marshes (metropolitan vc16)	TQ4880		4 July 2015	RMB	Scattered on margin of 'scrape' TQ 4803 8044
Holborough Marshes	TQ7062	SSSI, KWT managed reserve	1989	DP	TQ 706 622 (this may be a generalised grid reference). Confirmation desirable, but it would accord with FR's 1940s records.
South of Harrietsham	TQ85Q		After 1970, before 1981	Philp (1982)	
Bethersden	TQ93E		After 1970, before 1981	Philp (1982)	
Hamstreet	TR03B		After 1970, before 1981	Philp (1982)	
Cuckolds Coomb, nr Brook	TR04		15 July 1986	FR	Locally frequent, inferred to be at TR0744.
Molash	TR05F		After 1970, before 1981	Philp (1982)	
Seasalter Levels	TR0864	SSSI, RSPB reserve	6 July 2011	CJC & AP	(a) Coastal marsh, but not brackish. Estimated 101-300 plants, locally frequent. TR 0842 6429, 'field N', hay meadow, aftermath grazed. Generally associated species: *Carex divisa, Oenanthe silaifolia, Lotus glaber* and *Ranunculus sardous.* (b) Coastal marsh, but not brackish. Estimated 1-10 plants, rare. TR 0809 6416, 'field D', grazed by suckler herd of cattle. *Carex divisa* also present at ditch margin, *Oenanthe silaifolia* rare in field. (c) C. Coastal marsh, but not brackish. Estimated 1-10 plants. TR 0850 6413, 'field C', hay meadow. *Carex divisa* also locally frequent, *Lotus glaber* abundant in field. (d) Coastal marsh, but not brackish. Estimated 11-100 plants. TR 0878 6421, 'field B', hay meadow with immediate associates *Alopecurus geniculatus* F, *Agrostis stolonifera* F, *Ranunculus sardous* O, *Elytrigia repens* O. *Carex divisa* also abundant in field, *Oenanthe silaifolia* scarce, *Lotus glaber* abundant.
Seasalter Levels	TR0964	SSSI, RSPB reserve	13 June 2013	RG, LR & GK	Small amount in grassy field at TR 09085 64292.

Juncus ranarius Songeon & E.P. Perrier (Frog Rush)

vc 16, apparently gone from vc15

Rarity / scarcity status

Frog Rush is a plant of damp brackish coastal habitats, typically on mud- and sand-flats above the high-water mark, and is widely scattered in the British Isles, extending to inland salted roadsides in recent years. Its conservation risk status is considered to be one of 'Least Concern'. It was not generally recognised in the British Isles as a species separate from *Juncus bufonius* (Toad Rush) until 1978[335] and has only one Kent record since then until found further in 2019 and 2020. It is **rare** in Kent, with only two current known locations.



Crossness. Photos by Rodney Burton, 7 August 2019

Account

Philp (2010) refers to the species (under *Juncus ambiguus*) as last recorded in Kent in 1862, from Deal. This was apparently found by James Boswell Syme. There was, however, a later record represented by a specimen gathered in 1947 at Sandwich Bay, now at the National Museum Wales as part of collection donated by Barbara Welch and presumably a find of hers. Both Deal and Sandwich have much suitable terrain for this species and it is possible that it could be re-found there, overlooked as *Juncus bufonius.* More to the point as regards the subsequent history of the species as a Kent plant, there exists a record card for its finding by Ro Fitzgerald in 1986 by a track across Crayford Marshes at a grid-reference which is probably best interpreted as TQ 533 778[336].

Frog Rush was assumed to be 'probably extinct' in the county until its discovery by Rodney Burton and Juliet Cairns on 7 August 2019[337] at the Crossness Nature Reserve (sample grid reference, TQ 4939 8048). Many patches were found in a horse-grazed enclosure (West Paddock), at the edge of muddy depressions which are often water-filled, groundwater levels being usually governed by the operation of a wind pump. Associated plants included *Rorippa palustris* (Marsh Yellow-cress), dwarfed *Veronica anagallis-aquatica* (Blue Water-speedwell) and *Spergularia marina* (Lesser Sea-spurrey); *Plantago major* subsp. *intermedia* was also plentiful all around. The last two plants are particularly indicative of salinity, the tidal Thames being some 300m away. The presence of a small amount of *Puccinellia fasciculata* (Borrer's Saltmarsh-grass) at the site is similarly indicative. There are brackish dikes around the enclosure(s) here and the ground is shown as open at least back to ordnance survey maps of the 1870s. Eighteenth century maps show parcel layouts of varying consistency with the subsequent pattern, but the present site can be inferred to be a survivor of long-term open grazing marshes. It is of course not necessary to assume long-term continuity of the species here in view of the possibility of transmission by birds.

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[335] Cope, T.A. & Stace, C.A. (1978) The *Juncus bufonius* L. aggregate in western Europe. *Watsonia* 12: 113-128.

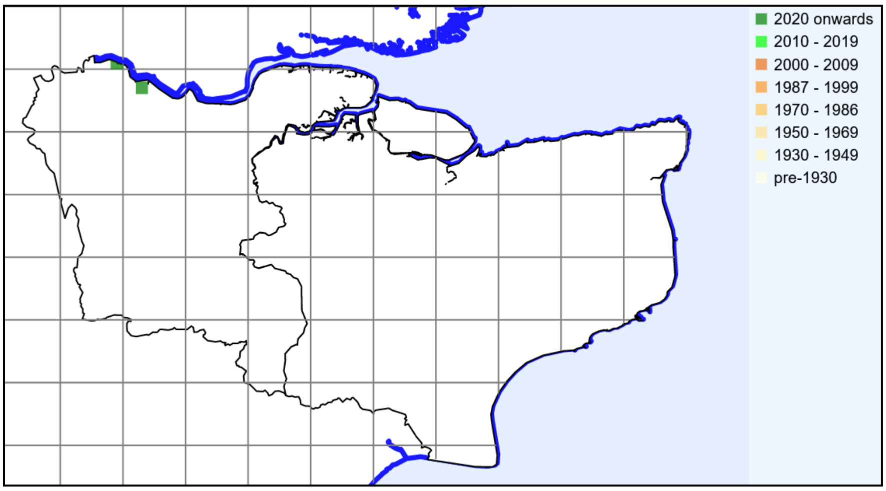
[336] Was stated as 51/353778.

[337] The species narrowly escaped earlier discovery, since a 2013 find at the site was taken to be *J. bufonius* and a specimen gathered in 2018 was mislaid before identification.

The Frog Rush at Crossness appears to have a distinct relationship with the ground kept open by changing water levels, with colonisation following the edges of slightly higher ground, where there is still the opportunity of bare soil for germination (the species being an annual), but not penetrating far into more permanent vegetation. Openness is maintained, not just by the limitations which the habitat places on the establishment of perennials, but also by the cracking of the mud in drying out, and by horse-trampling. The Frog Rush sometimes grows as distinct tufts on the broken dried mud surface and sometimes as a patch comprising a dense mat or sward, occasionally as an understorey to sprawling plants of *Spergularia marina*. The dense sward, illustrated in one of the accompanying photos, may be a product of seeding from individual tufts the previous year, which has found open ground not subsequently broken up. The plants in such a patch are small, atypically one-stemmed and more or less erect, with relatively few flowers and hence reduced seed production per plant; however, there must have been hundreds in any one such patch. However, populations appear subject to fluctuation from year to year: in 2020 there were only a few plants, small and late flowering.

Tufted growth, Crossness. Photo by Rodney Burton, 7 August 2019

On 23 July 2020 Geoffrey Kitchener found more in very similar habitat at Crayford Marshes, TQ 53110 76991 (indeed, the habitat was recognised as likely to yield the rush before it was found). This grid reference was taken from the edge of a dry (but seasonally wet) irregular oval depression in brackish grazing marshes c.25 x 35m, encompassing horse-trampled and grazed, semi-bare cracked and crumbly ground. *J. ranarius* was frequent as individual tufts around the edges where the ground was slightly higher, but still otherwise only part vegetated. Some tufts had become detached, and some rooted plants which had fruited were commencing fresh green flowering growth as well. The capsules were very blunt; fruits were clustered together as is typical with this species and the seed surface was smooth. A small colony was also observed in the adjoining monad, at the edge of a heavily grazed dry depression, TQ 5311 7742. It was not seen in the area of the 1986 record, which was c.450m away from the latter site. No sighting was made in 2021, when the habitat appeared unsuitable due to insufficient winter flooding and lack of grazing disturbance.



***Juncus ranarius* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Frog Rush seeds apparently germinate most effectively after dormancy is broken by cold, indicating spring germination. Exposure to light (e.g. in disturbed open terrain) also encourages germination, which is compatible with saline conditions and, although an increase of salinity beyond a certain concentration results in a lowered germination rate, ungerminated seeds have been found to be undamaged by the increased salinity. Higher salinity is more likely to obtain in summer, after evaporation, so germination compatibility with modest salinity again points to spring germination.[338]

Any apparent *J. bufonius* in a saline habitat should be considered for potential identification as *J. ranarius*, although the differences are not straightforward, as the *J. bufonius* aggregate as a whole is very variable, demonstrating considerable plasticity in many of its characters[339]. *J. ranarius* may have shorter stems (i.e. not exceeding 17cm), but most *J. bufonius* does not exceed this anyway. *J. ranarius* flowers bunch together, usually 2-3 together at the tip of an ultimate branch; *J. bufonius* flowers tend to be more spaced out, although small plants may be congested. The *J. ranarius* capsule is usually blunt, as long as, or longer than the inner tepals; the *J. bufonius* capsule is generally somewhat pointed (subacute) and as long as, or shorter than the inner tepals (so length does not help where inner tepals and capsules are equivalent). The inner tepals of *J. ranarius* are blunt, often emarginate with a mucronate tip; those of *J. bufonius* are more or less acute. The determination of Crossness material by Tom Cope was based on 'the blunt inner tepal, blunt capsule (perhaps a little too short) and dumpy barrel-shaped seeds'.

There is potential for further discoveries along the Thames estuary, given that it has also been recorded as abundant over a wide area of saline marsh at Aveley Marshes, on the Essex side of the river. It is not just saline marsh where it should be sought. Also, although not bordering the Thames, Essex discoveries at Jaywick in 2007-08 point to compatibility with more developed habitats: inside the sea wall adjoining a holiday park and a car park, and on a pavement

Crossness, habitat Photo by Karen Sutton, 2019

This account has benefited greatly from the involvement of Rodney Burton.

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[338] Kolodziejek, J. & Patykowski, J. (2015). Germination and Dormancy in Annual Halophyte *Juncus ranarius* Song & Perr. *Notulae Botanicae Horti Agrobotanici Cluj-Napoca*, **43(2):** 439-446.

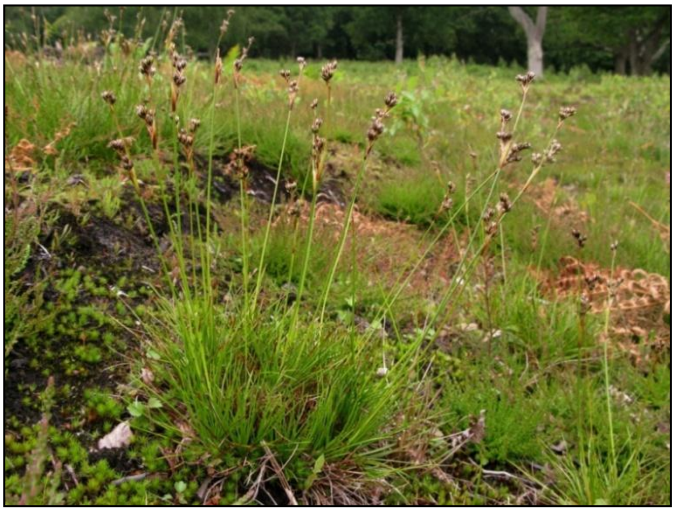
[339] Cope, T.A. & Stace, C.A. (1983). Variation in the *Juncus bufonius* L. aggregate in western Europe. *Watsonia* **14**: 263-272.

Juncus squarrosus L. (Heath Rush)

vc 15 and 16

Rarity / scarcity status

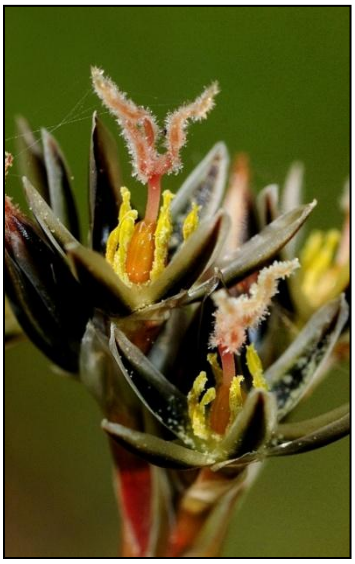
Juncus squarrosus is a common plant of wet heath and moorland, especially in northern England, Wales, Scotland and Ireland, and is sometimes dominant in wet upland acid grassland. In southern England its distribution is patchier, in line with the availability of lowland heath. Its conservation risk status in Great Britain as a whole and in England is one of 'Least Concern'. Due to the lack of suitable habitat, in Kent it is **rare** or possibly very **scarce**. It is a Kent axiophyte, indicative of good habitat.



Hothfield. Photo by Sue Buckingham, 21 June 2012

Account

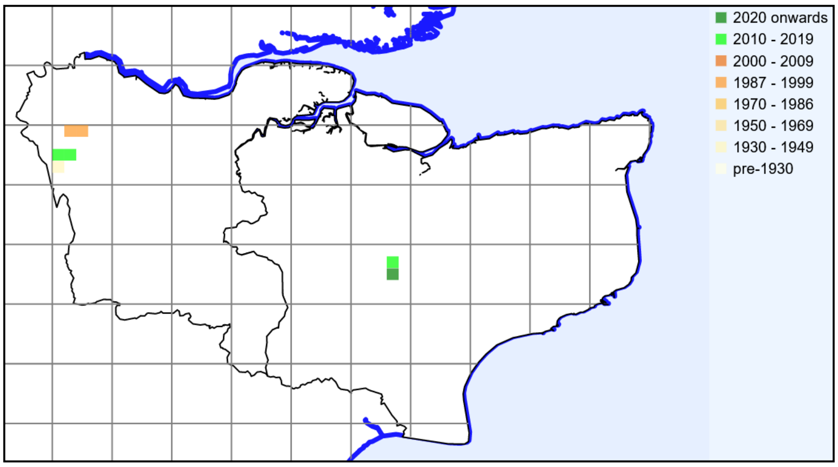
Even when more suitable habitat was present in Kent, it seems not to have been a common plant and was not noticed before Matthew Cowell's *A Floral Guide to East Kent* (1839) published records taken from Gerard Smith's manuscript notes (1830-33). Smith had seen it on Willesboro' Lease (Willesborough Lees near Ashford) and 'In Sandling Park, among heath & furze'. Hanbury & Marshall (1899) considered it to be a rare plant of moors, heaths and sandy wastes. The only other sites which they mentioned were at Keston Common (reported by Walter Reeves, before 1892); sandhills between Deal and Sandwich (found by Elizabeth Harvey, before 1873); on the commons (near Tunbridge Wells) (attributed to Forster, although Forster's *Flora Tonbrigensis* refers to the rush as 'on heaths every where', which doubtless includes Sussex as well); and Hothfield Heath (reported by William Jeffrey, before 1899).



Hothfield. Photo by Lliam Rooney, 19 May 2011

Contemporaneous with the publication of Hanbury & Marshall (1899) was the discovery of a further site by Henry Lamb, at Ightham Common, in a boggy place by Oldbury Camp. The rush was still present when visited by Francis Rose in 1944, at a damp, heathy beechwood by ponds near Crown Point (presumably there were open areas in the canopy and perhaps bracken was not then so extensive as now). Rose also found a further site in 1946 south of Wrotham Heath and the railway (Valley Wood), by a path and a small area of damp *Calluna* heath. The Wrotham Heath site persisted at least until the 1971-80 survey published as Philp (1982), when presence in only four tetrads was recorded in the administrative county.

These records exclude metropolitan vc16, where the acid soils of Keston and Chislehurst Commons still accounted for two further tetrad records. By the time of the 1991-2005 survey (Philp, 2010), only the two Hothfield tetrads remained for this species in the administrative county (although at least Keston Common continued in vc16 as well), so the history of Heath Rush in Kent has been one of decline. The position is the same as regards our 2010-24 records, now limited to Hothfield and Keston; a Farnborough site has apparently not survived redevelopment.



***Juncus squarrosus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Juncus squarrosus requires wet open conditions, although ground may be seasonally wet and the species is intolerant of complete submergence[340]. Its slow growth, need for light and inability to grow upwards with an accumulation of soil-raising litter means that it is a poor competitor, but on the other hand, it is little affected by grazing and trampling. This gives it an advantage in trodden areas, such as by pathways at Hothfield Common. It spreads vegetatively by the emergence of new shoots at the margin of a rosette extending at the rate of 1-2cm a year, and so gradually resulting in formation of a patch.

Seed requires light for germination and hence bare ground. The seeds are mucilaginous, according to Green (1969)[341] who suggested that this might facilitate carriage by birds. It might equally be inferred, however, that there is a potential for spread by animals and people using tracks by which the plant is growing. It is a short wiry rush, distinct from other British species.

Hothfield. Photo by Lliam Rooney, 19 May 2011

Site	Grid reference	Site status	Last record date	Recorder	Comments
Keston Common (metropolitan vc16)	TQ4164	SSSI	(1) 6 August 2016 (2) 13 June 2007 (3) 20 April 1987 and 8 August 1987	(1) SL (2) JP (2) RMB	(1) Keston Bog, small valley, TQ 4171 6434. Patch of plants on bare peat cleared of trees at northern edge of bog. Also on larger of two open grassland heaths on high plateau. (2) Main heathland area west of lake. (3) TQ 418 640, c. 150 plants.
West of Farnborough metropolitan vc16)	TQ4364		2015	JJ	Bassetts Campus, a small patch of acid grassland just north of junction of Starts Hill Road and Acorn Way, an area being developed (2017). The outlook for the species here is not promising; and its survival even to this point in such a built-up area is surprising. [Not found, 2024, and no likely terrain remains, GK.]
Chislehurst Common	TQ4369		20 June 1988	RMB	TQ 436 769, west of cricket ground. [Not found when re-visited in 2004

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[340] General ecological information is given by Welch, D. (1966). Juncus squarrosus L., Biological Flora of the British Isles. *Journal of Ecology* **54**: 535-548.

[341] Green, H.E. (1969). *Juncus squarrosus* L. – Dispersal of seeds. *Proc. Bot. Soc. Br. Isles* **7**: 562.

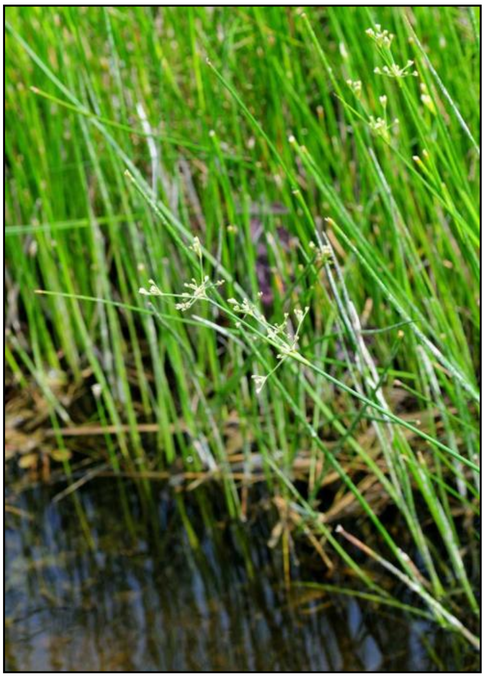
(metropolitan vc16)					(RMB).]
Wrotham Heath	TQ65I		After 1970, before 1981	Philp (1982)	A few plants in a small area. Presumably the 1946 FR site (see main text).
Sandway	TQ85V		After 1970, before 1981	Philp (1982)	A few plants in a small damp area.
Hothfield	TQ9645	KWT managed reserve, SSSI	(1) 23 June 2022 (2) 21 May 2016 (3) 25 May 2010 (4) 12 July 2000 (5) 6 August 1995 (6) 1991-99	(1) AL (2) SL (3) GK (4) JS (5) JPu (6) EGP (Philp, 2010)	(1) TQ 968 456. (2) Edge of fenced-off acidic meadow off western side of public footpath, TQ 9652 4596. (3) Frequent within this 1km square on the common, particularly on trodden areas. (4) TQ 969 456. (5) TQ 969 458. (6) Recorded as TQ94S. These are sample records only, this location having been visited by many botanists.
Hothfield	TQ9646	KWT managed reserve, SSSI	(1) 25 May 2010 (2) 1991-99	(1) GK (2) EGP (Philp, 2010)	(2) Recorded as TQ94T.

Juncus subnodulosus Schrank. (Blunt-flowered Rush)

vc 15 and 16

Rarity / scarcity status

Juncus subnodulosus is a plant of fens and marshes, locally frequent in England, especially in East Anglia, present also in Wales and central Ireland but barely reaching north to Scotland. Its conservation risk status in both Great Britain as a whole and England is one of 'Least Concern'. In Kent evidence of decline is ambiguous, and while it is rare in West Kent, overall it has been re-assessed from scarce to being uncommon, and is retained in the register as being a Kent axiophyte (an indicator of good habitat) whose varied habitat associations are all of interest.



Ham Fen. Photo by Lliam Rooney, 13 July 2013

Account

Blunt-flowered Rush (then known as *Juncus obtusiflorus*) was first published for Kent by Thomas Forster in his *Flora Tonbrigensis* (1816), in which he described it as 'On bogs, not uncommon' which, if it were to imply acid ground, seems not entirely apt, as the species is more frequently known where there is some base enrichment. The habitat description by Edward Jenner 'Wet pastures and other places, frequent' in his *Flora of Tunbridge Wells* (1845) seems more appropriate. Whilst there have been further Wealden records, the distributional assessment by Hanbury & Marshall (1899) as 'local (chiefly submaritime') in marshes, seems fairly representative of the position then and now. Records mentioned by them include marshes above Woolwich, sites near Oare and Faversham; Sandwich; Deal; Ham Fen; Eastwear Bay; and Preston (near Stodmarsh).

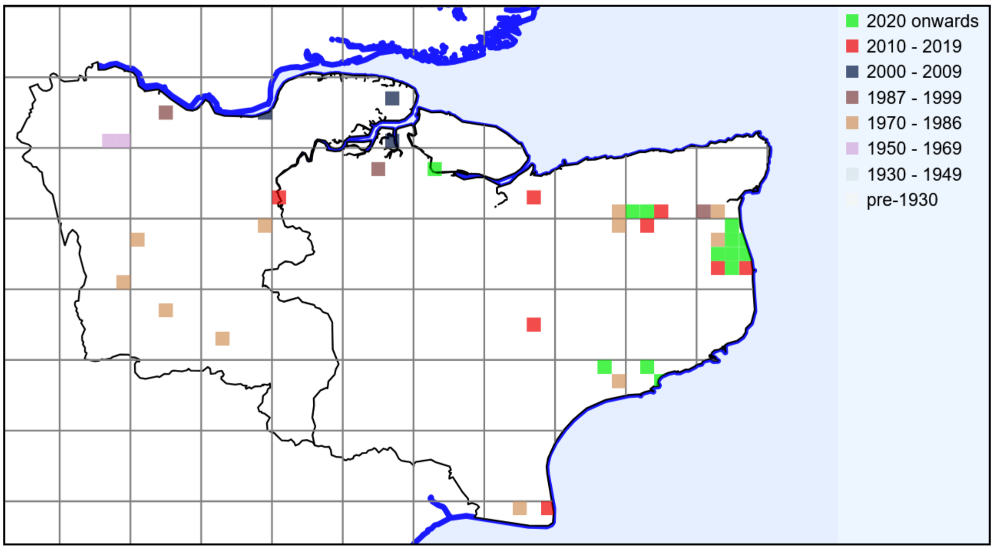
Much of this breadth of range was known to Francis Rose in the 1940s and 1950s, when he found *Juncus subnodulosus* at a flooded gravel pit near Oare Creek (1959); in a wet dune slack north of Deal (1946); in mixed fen with *Cladium mariscus* (Great Fen-sedge) at Ham Ponds (1946); in fen meadow at Wingham Fen (1946); in calcareous fen-meadow at Worth Minnis (1947); in flush areas over gault clay at East Wear Bay, Folkestone (1947). Rose also came across the species in a much wider range of localities, amongst which were: fen developing on a sandy lake shore at Leybourne Castle (1958); by a ditch in alluvial marshes at Barnes Cray (1944); in calcareous fen meadow at Holborough Marshes (1944; still there, 2014); in calcareous spring-fen on ragstone at Whitenbrooke, Seabrook near Hythe (1954); in calcareous spring-fen at The Lince, Etchinghill (1958; still in the vicinity, 2021); and in wet shingle pits north of the old railway station at Dungeness (1953).

Worth Minnis. Photo by Lliam Rooney, 5 July 2011

This fairly wide county distribution persisted until the county survey of 1971-80 published as Philp (1982), where the species was described as one of fens, marshes and dyke edges in areas with basic ground water, rather local and such that it could only be called frequent in the marshes just inland between Deal and

Sandwich. Sightings were recorded in 21 tetrads and these included a few in the south west of the county, reminiscent of the early 19th century Tonbridge / Tunbridge Wells records. However, that for TQ45V below Ide Hill contributed by Ray Clarke should be disregarded (the supporting specimen in **MNE** is not this species), and it is possible that others may also be in error where the geology might better suit *Juncus acutiflorus* (Sharp-flowered Rush). The 1991-2005 survey (Philp, 2010) only relocated six of these 21 tetrad records, adding three more, suggesting a decline of 57% overall (assuming no earlier errors in identification), and indicating almost complete loss from West Kent. This survey did not cover metropolitan West Kent and so omitted a 2003 find of a vegetative patch in a very anomalous habitat at the draw-dock west of the North Greenwich peninsula (TQ3880?).

Our recent records, for the period 2010-24, however, do not support the case for decline as *Juncus subnodulosus* has been located in 21 tetrads (28 monads), although only one of them is in West Kent (Holborough Marshes); so at least there does not appear to be evidence of further losses overall.



***Juncus subnodulosus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Juncus subnodulosus is a patch-forming perennial, with far-creeping rhizomes which may be matted below the surface, often present with other rushes, such *as Juncus inflexus* (Hard Rush) and *Juncus articulatus* (Jointed Rush). It forms part of, and may be dominant in, the *Juncus subnodulosus-Cirsium palustre* fen-meadow plant community (M22). This community, where ungrazed, commonly reaches 50-80cm in height, but *Juncus subnodulosus* may be noticeably taller (40-130cm). The assemblage indicates soils which are kept reasonably moist for most of the year and have a moderate to high base-status, and may be represented on terrain which is sloping, with seepage lines where ground waters reach impervious substrates; or on flat ground in badly drained hollows or valley bottoms, which may accumulate peat below. Rodwell[342] refers to such communities as being secondary, derived and maintained by mowing and/or grazing; and *Juncus subnodulosus* is often one of the strongest threads of continuity from the precursor community, being adapted to survive both the former traditional annual summer mowing and grazing.

Whilst the species is especially associated with calcareous peat, it may also grow on alluvium or sand, and it shows some salt tolerance[343]. Our 2010-24 records include numerous ditches by grazing marshes, especially in fen conditions; a wet calcareous meadow at Etchinghill with *Carex flacca* (Glaucous Sedge), *Carex otrubae* (False Fox-sedge) and *Juncus articulatus* (Jointed Rush); in an elongated old dune slack at Sandwich Bay with *Carex elata* (Tufted-sedge), *Carex otrubae* (False Fox-sedge) and *Phragmites australis* (Common Reed); seepage points / spring-lines at Folkestone Warren undercliff where impervious Gault Clay underlies chalk; and a wet peaty mire at Ham Fen.

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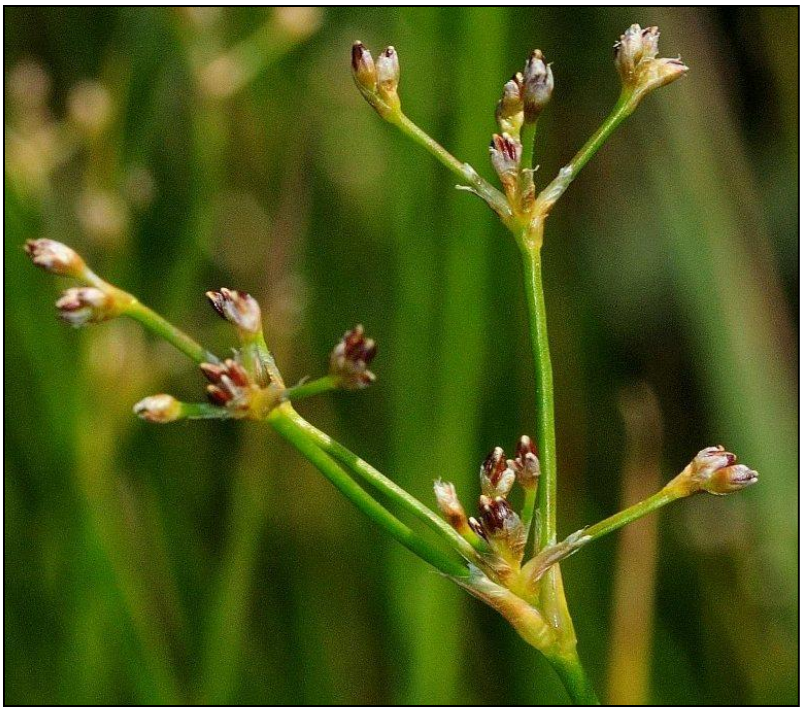
[342] J.S. Rodwell (ed.)(1991) British Plant Communities, vol. 2, Mires and heaths. Cambridge University Press, Cambridge.

[343] Richards, P.W. & Clapham, A.R. (1941). *Juncus subdodulosus* Schrank. (*J. obtusifolius* Ehrh.). Biological Flora of the British Isles. *Journal of Ecology* **29**: 383-391.

It is noticeable as having pale florets when young. These darken later, but then the inflorescence is distinctive with its branches diverging widely and becoming reflexed. The leaves are distinctive as having both cross-partitions – as do *Juncus articulatus* (Jointed Rush) and *Juncus acutiflorus* (Sharp-flowered Rush) – and longitudinal partitions (which they do not).



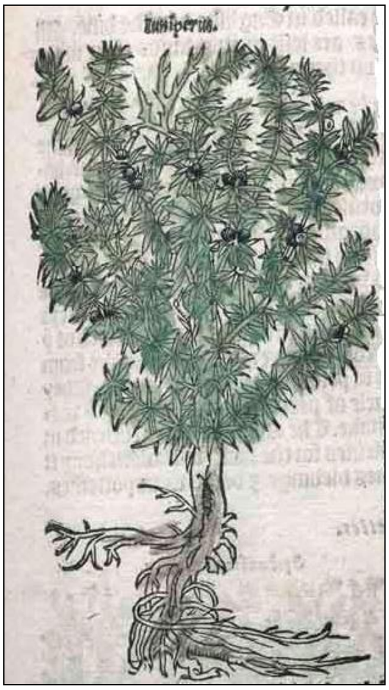
Worth Minnis. Photo by Lliam Rooney, 5 July 2011

Juniperus communis L. (Common Juniper)

vc 15 and 16

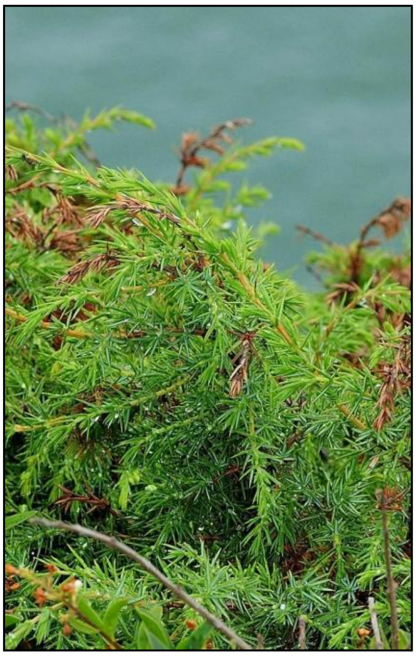
Rarity / scarcity status

Juniper is a very local shrub or small tree throughout much of Britain and Ireland, absent from much of the south west and from central and eastern England. It has been in decline through the loss of scrub communities by over-grazing, burning or woodland succession/afforestation. Regeneration from seed is often poor. It requires the presence of both male and female plants, the availability of bare ground and the absence of grazing-off seedlings. Juniper is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. Its earlier status as a UK Biodiversity Action Plan priority species gave rise to planned actions are targeted towards maintaining the species' current range and overall population size, achieving natural regeneration at sites under conservation management, and maintaining or re-establishing populations at sites not under direct conservation management.



From William Turner's Herball, 1562.

The lowland plant is *Juniper communis* subsp. *communis* and, whilst its conservation risk status in Great Britain as a whole is of 'Least Concern', in England it is considered to be **Near Threatened**. The assessment of Near Threatened is based on a reduction both in the overall geographical extent of its occurrence in England and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 24% and its area of occupancy had declined so that there was a 20% reduction in the likelihood of recording the species. Viewed on a much wider timescale[344], the number of 10km squares in which it was recorded in the period 1987-99 had in East Kent declined to four (from 11 over all time before), a loss of 64%; and in West Kent the decline was from seven 10km squares to five, a loss of 29%. However, in Kent, Juniper falls short of qualifying as rare or scarce, because of the number of extant sites; but it may be regarded as at risk because of the earlier decline and the ageing of colonies without recruitment of young plants. It is a Kent axiophyte, and so is indicative of good habitat.



Dover. Photo by Lliam Rooney, 5 July 2011

Account

Juniper has a very early first published county record, that of William Turner in Part 2 of his *Herball* (1562), in which he states that 'In England it groweth most plentuouslye in Kent'. This abundance is still reflected in the account by Hanbury & Marshall (1899), who regarded it as locally common, but sufficiently frequent along the North Downs across Kent that they did not enumerate individual records for that area. The only areas where it was not to be found were what is now metropolitan north west Kent; Sheppey and the adjoining mainland; and Thanet.

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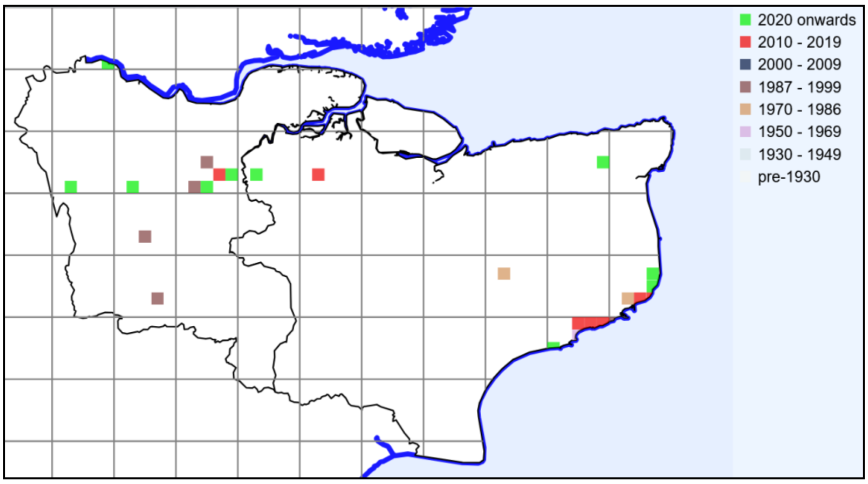
[344] Ward, L. (2007) *Juniperus communis* L. Plantlife dossier, http://www.plantlife.org.uk/wild_plants/plant_species/juniper accessed 14/11/2015

This distribution has shrunk considerably since then, in particular as regards the North Downs from Burham eastwards to the coast. Sites in this latter area were known to Francis Rose, such as at Yockletts Bank (1958); Fanscombe Wood, east of Wye (1959); and Petham (1959). In the 1971-80 county survey (Philp, 1982), 13 tetrad records were made. The species was considered to be declining: many of the adult bushes appeared to be suffering from the effects of a fungus and there were no recent reports of any seedlings in the country. Apart from a number of bushes on Southborough Common (*c.*30 in 1960, 20 in 1997, none of which can now, 2019, be traced), all other localities were on the chalk.



***Juniperus communis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

During 1990-2005, again 13 tetrad records were made, although only eight represented the same tetrads. By then, some known shrubs had died as a result of fungal infection, and others on the cliff tops in the east of the county had been lost through erosion. The records included a further non-chalk location, a single plant some 2m high at Fawke Common, which appears to have been long lost, perhaps to management work.

Surveys of 26 colonies were noted by Plantlife (Ward, L., op. cit.) as having been carried out in 1971 and 1999, resulting in estimates of 183 and 138 bushes respectively, a decline of 26%. Plantlife's assessment was that Juniper on the North Downs is in a terminal state of decline with only small numbers in Kent; but holding its own in low numbers on the eroding chalk cliffs on the east coast of the county where it is less dependent on agricultural practices.

Recording in the period 2010-24 has produced 17 tetrad (19 monad) records, some of which are of unclear status, and including two bushes planted at Downe Bank and 30 or so presumed planted at Kingsdown. Only some of those 2010-24 records come from the same tetrads as the 1991-2005 records; so, although it appears from total numbers that occurrence in the county has been broadly constant since 1971, the total has been maintained by new discoveries. These are not necessarily 'new' plants, although it is possible that there is recruitment of bird-sown plants, particularly on migratory routes. Many of our records are of single bushes, probably of considerable age, and unable to reproduce because both male and female bushes are required. A lone bush noted at Burham in 2022 was understood to be one which Eric Philp had recorded for 40 years and which had hardly changed in that time. If the strategy of juniper is one of a mobile plant, exploiting favourable situations for colonisation within the area of bird dispersal movements, then this is likely to be ineffective with us when the seed resources are insufficient to result in both males and female bushes arriving in proximity. Bushes may appear in unlikely places: there is one (found 2000 and still present in 2015, 3m high; also 2020), rooted above the reach of tides, at the Thames estuary near Cross Ness.

Although tabular information regarding sites is not being included here (and a fuller dataset of Kent juniper records is maintained by Julian Russell) , conservation interest in this species is such that it is worth providing information as regards selected colonies.

Shoreham, TQ 528 612 and 529 612. Mentioned by de Crespigny in *A New London Flora* (1877) as present east of Shoreham; recorded also in 1929; and said by Francis Rose to be abundant in 1945, with about 40 plants in 1952 and 20 in 1963, plus many dead. On 5 July 2010, the colony was noted (GK) as consisting of five individuals growing on a chalk slope with a western aspect. These appeared perhaps healthier than they have been at times before, except for one with a damaged stem, although the quality of the surrounding downland flora had declined, with increasing tree and shrub seedlings, despite some scrub cutting. There were two males and three females, ranging from 1.75 to 6m high. All (but one) were over-shaded, partly to severely, two with scrub growing up from their rooting points. There was no sign of regeneration.

Shoreham. Photo by Geoffrey Kitchener, 21 November 2015

Folkestone Warren, TR 248 380. Present at least since 2007 (and clearly much older than this), one male bush, 3.5m high by 2.5m wide, was noted on 3 August 2010 (LS, JN) in Folkestone Warren SSSI (TR 2483 3801), growing on the chalk cliff with a south western aspect in an area of undercliff characterised by slumps and steep cliffs. In front of the bush was rabbit-grazed chalk grassland, but its immediate surroundings, particularly behind, were in need of scrub control, massive scrub encroachment having taken place in the area since removal of grazing animals, even the steeper, more exposed parts of cliff being swamped by *Betula pendula* (Silver Birch), *Buddleja davidii* (Butterfly-bush), *Cornus sanguinea* (Dogwood), *Crataegus monogyna* (Hawthorn), *Ilex aquifolium* (Holly), *Ligustrum vulgare* (Wild Privet).

Samphire Hoe (Shakespeare Cliff), c. TR2927 3918. This site may correspond to the reference in Rose & Géhu (1964)[345] to Juniper being rare at the edge of cliff-tops between Folkestone and Dover (although Francis Rose listed it in 1955 as at the cliff edge, TR 305 396). It is an area difficult to survey in its entirety because of the precipitous cliff. When observed by SB through binoculars from below at Samphire Hoe on 10 July 2014, many bushes appeared diseased, with large patches brown and bare of leaf. The population comprised 31 plants (PHo, pers. comm.) and included male and female bushes.

Dover (Langdon Hole), TR3442. This may be the same site as given by Matthew Cowell in *A Floral Guide for East Kent* (1839) as contributed by Miss Elizabeth Harvey for a location between Dover and St Margaret's Bay. Francis Rose also saw seven bushes at the Langdon Bay cliff tops in 1953 (TR 345 425). It was recorded by a KBRG meeting on 12 July 2010 as a small wind-sculpted bush on the very cliff edge at Langdon Hole, TR 34449 42505. There are more plants: on the public footpath which drops down the vertical cliff-face, at TR 34559 42540, KBRG meeting attendees were able to look up and back at the vertical cliff face and, with binoculars, see four plants (it was understood that eight are known).

These sample site records exemplify a number of themes: the small size of some populations; the potential for loss through disease or erosion (although conversely erosion may provide open ground for regeneration); the competition arising in some locations from encroaching scrub; and the absence of record of recruitment.

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[345] Rose, F. & Géhu, J.M. (1964). Essai de phytogéographie comparée. La végétation du Sud-Est de l'Angleterre et ses analogies avec celle du Nord de la France. *Bulletin de la société botanique de France* 90ème session extraordinaire 38-70.

Juniper is tolerant of frost, nutrient-poor soils and (except when young) drought[346]. It may be browsed, but is apparently not very palatable to herbivores (although seedlings are vulnerable). In consequence, it may act as nurse to other trees or shrubs which may establish themselves in its shelter. It shows some tolerance to scrub which may grow around it; and, although not able to cope with deep shade, it will survive and grow in levels of a fifth of normal sunlight. Its life span, however, is likely to be shortened by shading. Seed viability may be affected by the age of the bush, its nutritional status, insect predation and seeds not fully formed; and for those seeds which are sufficiently formed, delayed germination of three to five years is common. Blackbirds, mistle thrushes and song thrushes are considered to be the main dispersal agents of the cones (berries) in Britain, although the results do not appear to be particularly effective in Kent for colony expansion. Life span on the southern chalk is reckoned to be 100-120 years.

Shoreham. Photo by Stephen Lemon, 16 July 2014

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[346] General ecological information from Ward, L. (op.cit.) and from Thomas, P.A., El-barghathi, M. & Polwart, A. (2007) *Juniperus communis* L. Biological Flora of the British Isles. *Journal of Ecology* **95**: 1404-1440.

Knautia arvensis (L.) Coult. (Field Scabious)

vc 15 and 16

Rarity / scarcity status

Field Scabious is frequent in grassland over most of the British Isles, but absent from most of north and west Scotland. Despite this, its conservation risk status is assessed as of 'Least Concern' in Great Britain as a whole, but in England it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 23% in the likelihood of recording the species; and it is the rate of decline, rather than absolute numbers of the species remaining, which causes this reassessment. In Kent, there appears to have been a decline of 37% over shorter time, between the periods 1971-80 and 1991-2005. The rapidity of local decline is, however, not borne out by subsequent recording but, despite this and although the species can be ranked neither rare nor scarce in the administrative county, its status still gives some cause for concern. It is a Kent axiophyte and so is an indicator of good habitat (at least, where not sown as a 'wildflower').

Account

The first printed record of Field Scabious for the county is by Thomas Johnson, who recorded it whilst travelling along the main road between Gravesend and Rochester (*Iter Plantarum*, 1629). On his next journey, in 1632, he remarked on a white form of this species en route from Margate to Nash. The species appears to have been generally common enough that it was more worthy of remark when an unusual form was found, as with Edward Jacob (*Plantae Favershamienses*, 1777), who remarked on a plant with proliferous flowers in Badgen Wood; and Thomas Forster (*Flora Tonbrigensis*), who saw white, red and blue flowered plants. Hanbury & Marshall (1899) considered *Knautia arvensis* to be very common throughout the county, at banks, cliffs, fields and pastures. Francis Rose noted it as a native of roadsides, grassland, scrub and wood borders, abundant on chalk and ragstone, rare elsewhere.

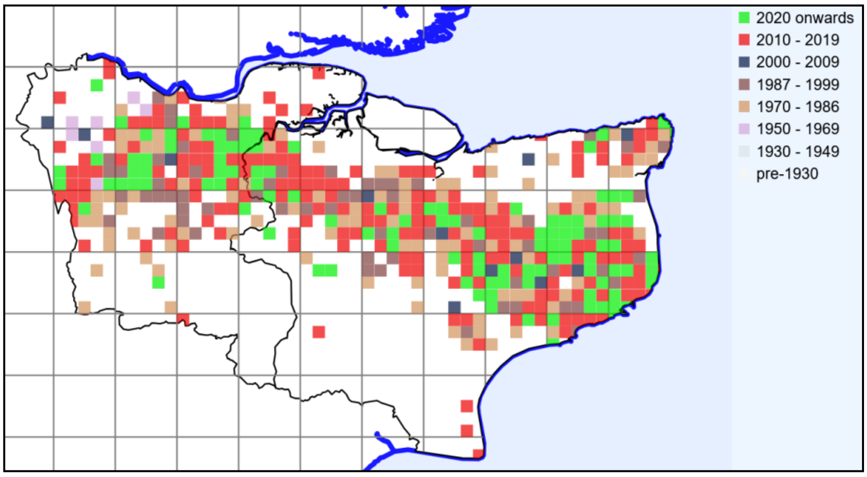
Bredhurst, habitat. Photo by David Steere, 22 July 2015

Philp (1982) recorded the species in 382 tetrads, finding it in dry grassy fields, at roadsides and on cliffs, being common on the chalk. It was noticeably missing from Dungeness and nearly all of the Weald. A similar distribution was shown by Philp (2010), but significantly thinned out, so that only 243 tetrads were given. The species was noted as a plant of rough pastures, hedgerows, wood borders and roadside verges, particularly on the chalk; but no suggestion was given as regards potential causes of decline, nor are these apparent.

Although many calcareous grassland species have shown declines which can be related to increased atmospheric nitrogen deposition, this does not seem to be the case with *Knautia arvensis*, which apparently reacts positively.[347]

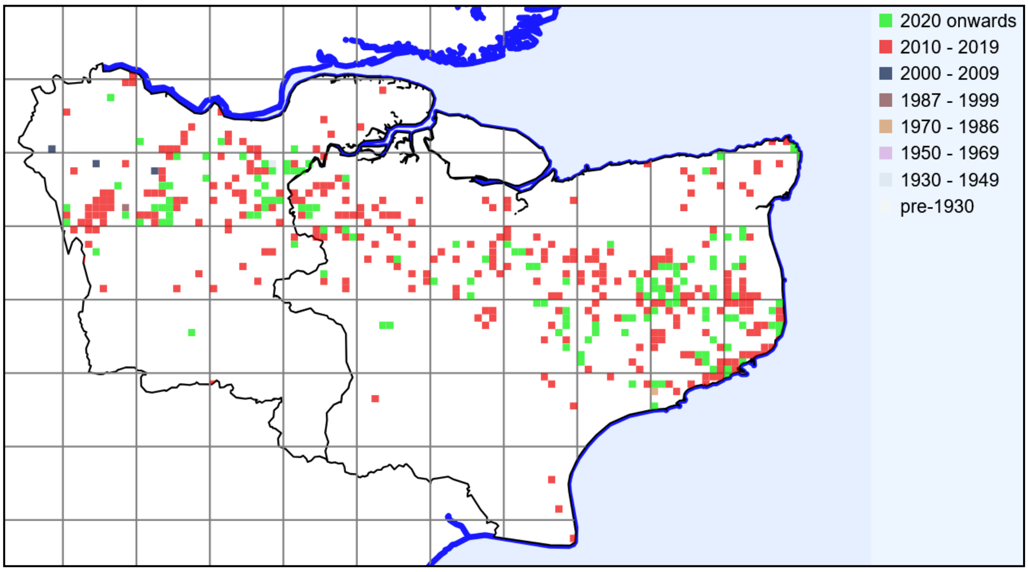
Nashenden. Photo by David Steere, 18 October 2015

While the 2010-24 records amount to 291 tetrads (440 monads) and so have well overtaken the 1991-2005 total of 243, the recent dataset includes 20 metropolitan West Kent tetrads and so overstates the comparison. Nevertheless, the overall position as shown in the accompanying tetrad distribution map appears to be overall decline from the 1970s, a general thinning out, without discernible pattern. Occasional recent records beyond the scope of earlier surveys, and away from the chalk, e.g. at Dungeness and the Hoo peninsula, may be due to inclusion of the species in some wildflower seed mixes and this is the suspected origin of some metropolitan West Kent sightings. In general, it is absent from the Weald (and this is the case in relation to the Sussex Weald, too).



***Knautia arvensis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Records at monad resolution are given below, and these emphasise recent presence, as monad recording only became the norm in Kent from 2010.



***Knautia arvensis* Kent records to 2024 mapped at monad level, from BSBI database.**

Knautia arvensis[348] is a perennial with a strong tap root, growing on well-drained to moderately dry soils, generally in open places where grazing is absent or irregular. It is pollinated by butterflies and bees, providing a late-season source of nectar; and in southern Sweden, it has been considered as a potential indicator for species-richness in bees. It spreads by rhizomes (but clonal growth is very limited) and by seed, which has a short range of dispersal, potentially assisted by ants. Together with *Scabiosa columbaria* (Small Scabious), it is the only pollen source for *Andrena hattorfiana* (Large Scabious Mining Bee) which has a Kentish presence, e.g. at Queendown Warren, Burham Down and Ranscombe (NBN data). Seed production has been assessed at a mean of 520 seeds per plant and a long-term persistent seedbank is formed with seed viability exceeding 35 years.

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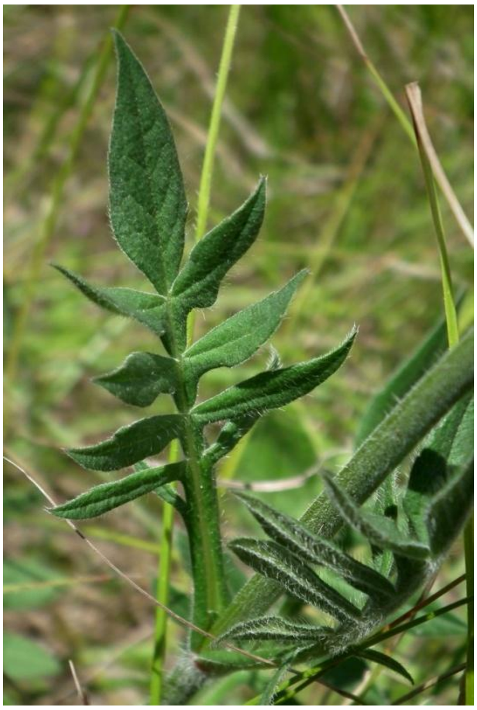
[347] Henrys, P.A. *et al.* (2011). Impacts of nitrogen deposition on vascular plants in Britain: an analysis of two national observation networks. *Biogeosciences* **8**: 3501-3518.

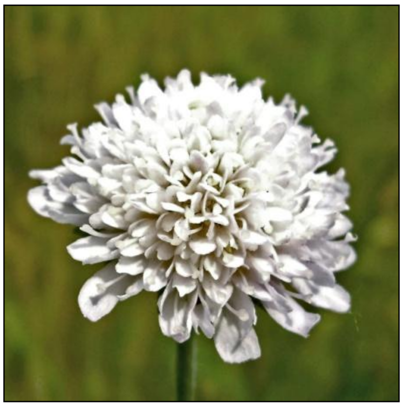
There is a degree of variation in its flowers: colour can range from bluish-lilac to purple, pink-violet, red-violet or white; and separate plants bear either female or hermaphrodite inflorescences, the latter having larger outer flowers (an extreme example of which may be seen in one of the photos below).

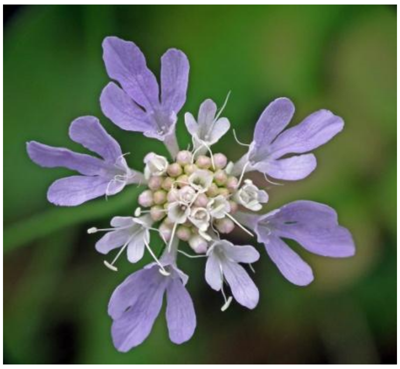
It may be distinguished from *Succisa pratensis* (Devil's-bit Scabious) by the latter generally having dark bluish-purple flowers (those of *Knautia arvensis* are usually bluish-lilac) and more or less untoothed, entire stem-leaves (those of *Knautia arvensis* are mostly pinnatifid). It may be distinguished from *Scabiosa columbaria* (Small Scabious) by the latter's smaller, slenderer appearance with corollas 5-lobed (4-lobed in *Knautia arvensis*).



Stem leaves, Bredhurst. Photo by David Steere, 10 July 2015

Variation in *Knautia arvensis*. Photos by David Steere: (top, female) Cuxton 26 June 2013; (bottom, hermaphrodite) Shoreham, 30 August 2015





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[348] General ecological data provided by Varga, S., Soulsbury, C.D. & John, A.J. (2022). Biological Flora of Britain and Ireland: *Knautia arvensis*. *Journal of Ecology* **110**: 1970-1992.

Kent Rare Plant Register
Species accounts Part L

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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The register formerly included the following species accounts which may now be found at **Appendix A** of the register, https://bsbi.org/kent

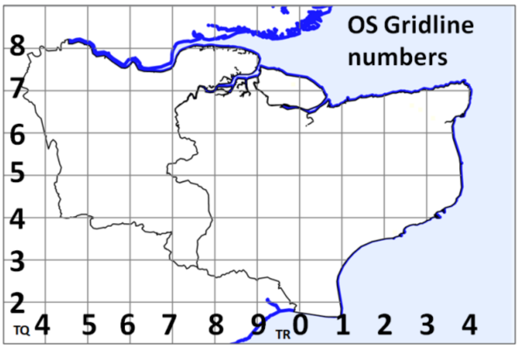
***Laphangium luteoalbum* (*Gnaphalium luteoalbum*) (Jersey Cudweed)**
***Limbarda* (*Inula*) *crithmoides* (Golden-samphire)**

Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

ADRH Tony Hare
ACH Andrew Henderson
ACL Alan Leslie
AG Alfred Gay
AGS Trudy Side
AH Tony Howard
AL Alex Lockton
AW Anne Wilkes
Awa Ann Waite
AWi Tony Witts
AY Andrew Young
BBe Ben Benatt
BS Barry Stewart
BW Brian Woodhams
CAS Clive Stace
CB Caroline Bateman
CBa Charles Bailey
CO Colin Osborne
CS Cath Shellswell
DC David Carder
DCh Danny Chesterman
DG Doug Grant
DM Daphne Mills
DMi David Mitchell
DS David Steere
DTS David Streeter
EGP Eric Philp
ESM Edward Marshall
EW Elizabeth Winterbourne
FB Fred Booth
FBr F. Brent
FJH Frederick Hanbury
FR Francis Rose
GK Geoffrey Kitchener
GS Geoff Smith
HS Heather Silk
HTM Henry Mennell
JAR Jacqueline Rose
JBe Jim Bevan
JGM Gina Murrell
JH Jane Howard
JL Judith Lovelady
JP Joyce Pitt
JRP John Palmer
JS Judith Shorter
JSH Prof. J.S. Henslow
JTBS John T.I.Boswell Syme
JVC Judy Clark
KBRG Kent Botanical Recording Group
KC Ken Chapman
KFC Kent Field Club
LBB L. Breda Burt
LR Lliam Rooney
LS L. Simmons
MHD M.H. Dolling
MJI M.J. Ingrouille
MP M. Pickard
MT Mario Tortelli
OL Owen Leyshon
PAH Paul Harmes
PBu Paul Buckley
PDS Peter Sell
PH Peter Heathcote
PHa Paul Harmes
PHO Philip Oswald
RC Richard Carter
RD R. Dix
RG Bob Gomes
RoF Rosemary FitzGerald
SB Sue Buckingham
SC Steve Coates
SDP S.D. Prince
SL Stephen Lemon
SLP Sharon Pilkington
SP Sue Poyser
TI Tim Inskipp
WC William Christy junr.

Other abbreviations and references:

BM = Natural History Museum herbarium	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MNE = Maidstone Museum herbarium	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
Hanbury & Marshall (1899) refers to their *Flora of Kent*	MoD = Ministry of Defence	RNR = roadside nature reserve
		SLBI = South London Botanical Institute herbarium

Lactuca saligna L. (Least Lettuce)

vc 15 and 16

Rarity / scarcity status

Lactuca saligna is a **nationally rare** plant, designated as an **Endangered** species in both England and Great Britain as a whole. It currently grows in coastal areas, especially sea wall embankments, and was thought in the 1990s to be restricted in the British Isles to two populations, one in Rye harbour in East Sussex and the other at Fobbing in Essex. It transpires, however, that there are two colonies in Kent as well, perhaps best interpreted as three, which qualify it to be regarded as **rare** in the county.

Sheppey. Photo by Lliam Rooney, 27 August 2013

Account

The first Kent record was given by John Ray in the second edition of his *Synopsis Methodica Stirpium Britannicarum* (1696), in which he refers to '*The least wild Lettuce or Dwarf-Gum-Succory*' – '*By Mr.* Dale *it was found in* Eriffe-*Marshes in* Kent'. Hanbury & Marshall (1899) identify a further record not far from Erith Marshes, at Plumstead Marshes (where abundant in 1873 and much collected at least from 1845 to 1884), together with others at Charlton (indicating a presence which probably extended through Woolwich Marshes to Plumstead Marshes); Cliffe; between Gravesend and Shornemead (and below the Fort); near Sheerness; between Herne Bay and Whitstable (it was much collected in the 1870s and 1880s at Whitstable); under Swalecliffe; at Seasalter; and Wouldham. Except for last record, for the tidal Medway valley, there is a clear pattern of distribution along the Thames valley, extending along the north coast. Hanbury and Marshall's assessment was that it was a rare species, a plant of marshes and shingly beaches.

This distribution subsequently thinned out, with still a range of occurrences by the 1940s, much fewer after the 1970s, and then diminishing to a point when it was thought to be gone. Records for the London area dropped off in the early 20th century, the last place being Stone Marshes (1903, 1925, 1935, 1955, 1967) where it is possible[349] that there was some recruitment from larger populations on the Essex side of the Thames. It was not recorded at Dartford Marshes after 1901. Further east, it survived longer and Francis Rose (in litt.) stated that "My notebooks make it clear that in the late 'forties and 'fifties *L. saligna* was plentiful in several years from about Shornmead fort to Higham Marshes, and again about Cliffe Creek and Cooling sea wall… then again plentiful both W of 'Sportsman' for some way, and east of the pub, *behind* the *chalets* along the road (about 070649 etc. to 1952)". He noted in his MS *Flora of Kent* that there had been some diminution after the floods of 1953; but there was continuity up to the 1971-80 survey of Philp (1982), with a spread in the Seasalter area and a series of records from Higham (where recorded 'in quantity' by Jim Bevan in 1976) along the Cliffe/Cooling coast (recorded by Tony Hare in 1978 as part of fieldwork for a paper, Prince & Hare (1981[350], in which the colony size is given as about 100 plants, but there is reference to population fluctuations at Cliffe between 48 and 303 plants over a five year period). Sightings at Dungeness (1947) and Greatstone (1954) do not seem to have been followed by persistence in south east Kent.

After 1978, however, records dropped off generally. At least one site (Seasalter) was adversely affected by a storm, which had buried the *L. saligna* site on the sea wall in shells and sand[351]; subsequent unconfirmed records were discounted by Rosemary FitzGerald, when she reviewed the position in 1987[352]. It was her view that the losses after this time were attributable to major works in the 1980s on the sea walls which irrevocably changed the habitats in all the then known sites. The species was then considered extinct on the Kent shores of the Thames estuary although presciently Rosemary FitzGerald suggested the possibility of presence where not formerly recorded, and where habitat was less damaged, such as in parts of the Isle of Grain or at Elmley Marshes in Sheppey (where Francis Rose, *in litt*. 1986, had written "There are long stretches of very-suitable-looking sea walls there, and (at Elmley Hills and Harty) dry grassy slopes, ± natural, down to the saltings where *Lactuca* and *Trifolium squamosum* could occur still)".

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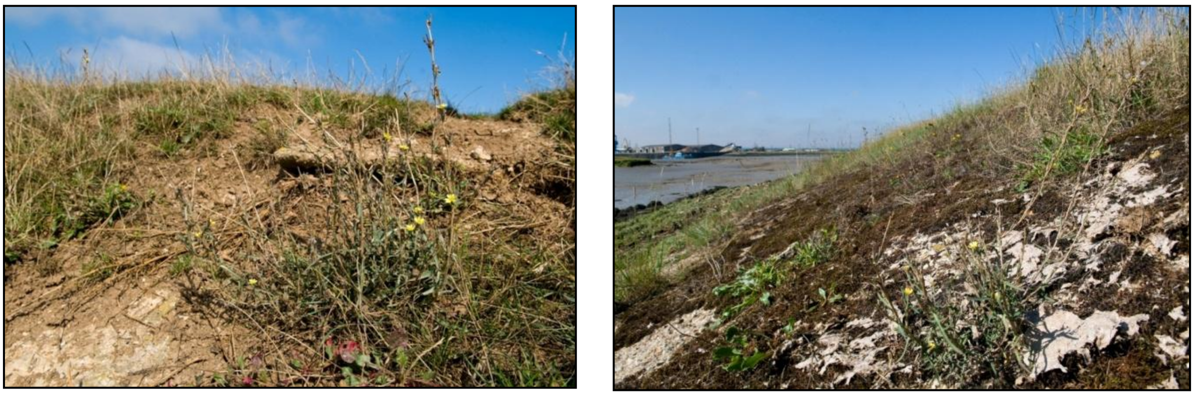
[349] Per R.M. Burton, *Flora of the London Area* (1983).

[350] Prince, S.D. & Hare A.D.R., in (ed.) Synge, H. (1981). *The Biological Aspects of Rare Plant Conservation*, pp.379-388. BSBI.

[351] Side, A.G. (1979). 26th August [1978] – Seasalter (meeting report). *Kent Field Club Bulletin* **24**: 23-24.

This prediction was realised about 20 years later when (1999) Least Lettuce was found along the sea wall on the west side of Yantlet Creek, which marks the beginning of the Isle of Grain; and in 2000 a sea wall survey commissioned by the Environment Agency located the species on Sheppey, alongside the Swale, near The Dray, which marks the beginning of Elmley Island. A re-assessment was undertaken in 2013, and Least Lettuce was found present at both sites.

At Sheppey, *Lactuca saligna* appeared to require bare or semi-bare terrain for establishment and most plants were found on the sea wall centred at the junction of the London Clay upper slope with the lower concrete batter, and in cracks in the concrete. Some of the plants in the concrete descended well down the slope towards the area of marine influence. The species was also growing scattered on the upper clay slopes which were only lightly vegetated and where there was some cracking and crumbling – partly due to the angle of slope and the drying out of the clay, but also due to cattle-trampling. The upper level plants tended to be smaller and it looked as though most were of current year's growth. The larger lower level plants were assumed to have over-wintered; and one specimen exhibited a thick woody stem base or upper tap root which suggested the possibility that it was behaving as a biennial. Associated plant species were very much as one might expect in such coastal grassland with some ruderality, but included rare plant register species *Bupleurum tenuissimum* (Slender Hare's-ear) and *Hordeum marinum* (Sea Barley).



Sheppey, habitat. Photos by Bob Gomes, 27 August 2013.

Part of the Sheppey site was lost to Least Lettuce in 2015 as a result of Environment Agency works to the batter of the sea wall, by drizzling concrete over the slope, which took away availability of some of the cracks in the concrete in which the plant grew[353]. The extent of the colony has accordingly been reduced, although a count in 2021 indicated that overall numbers appeared unaffected, with a total of 1700 plants, as compared with 1028 in 2012.

There is a strong contrast between this section of coastline and its continuation around Dray Bay. The continuing section is not cattle-grazed, the grass is high and there is minimal open ground within which

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[352] Fitzgerald, R. *Lactuca saligna* L. Least Lettuce. Unpublished NCC report, December 1987.

[353] Kitchener, G. (2021). A survey in Sheppey, August 2021. *Kent Botanical Recording Group newsletter* **14**: 20-21.

Lactuca might establish. This emphasises the apparent fragility of the habitat of the L*actuca* section and the importance of an appropriate grazing regime.

At the Isle of Grain site in 2013, following the sea wall northwards along Yantlet Creek, *Lactuca saligna* was not seen at the first location where found in 2000, but was picked up 20m or so further northwards, when plants were found on the west (creek-) facing wall on the upper parts of the London Clay slope, which was heavily poached by cattle with much broken, semi-open ground. Associated species reflected disturbance in a sub-maritime context, including *Beta vulgaris* subsp. *maritima* (Sea Beet), *Hordeum marinum* (Sea Barley), *Rapistrum rugosum* (Bastard Cabbage), *Sonchus oleraceus* (Smooth Sow-thistle) and *Torilis nodosa* (Knotted Hedge-parsley). On the inland side of the seawall (east or south-east facing) were eight plants, the only *Lactuca saligna* find on the inland side of the Yantlet Creek seawall. As the seawall turned eastwards, away from the creek and facing northwards to the Thames estuary, *Lactuca saligna* ceased to be recorded on the coast-facing seawall slope, which now changed its character, became dominated by coarser vegetation and at times was more influenced by the proximity of the sea wall. The species instead appeared on the inland upper (south-facing) slopes of the seawall, again on cattle-poached clay. The extent of occurrence eastwards was investigated in 2017, and further plants were found.

In 2018 David Steere found plants on the west side of Yantlet Creek, i.e. on the mainland of the Hoo Peninsula. As they were not opposite the Isle of Grain plants and were in different monads/tetrads, a more southerly location altogether, this population is not obviously derivative from them; and, indeed, a further survey in 2020 showed that there were well over twice as many plants on the west side of the creek than had been found on the east side in 2013, extending along some 700m with a few outlying plants about 250m away.. The aspect of the seawall slopes (in this case mostly south or south-east) seems less relevant to the plant's distribution than their openness, maintained by cracking of the London Clay and often by cattle trampling as well. Associated species were, most constantly, *Bromus hordeaceus* (Soft-brome), *Helminthotheca echioides* (Bristly Oxtongue) and *Lolium perenne* (Perennial Rye-grass); but plants seen at other sites also featured, such as *Hordeum marinum*, *Sonchus oleraceus* and *Torilis nodosa*.

Grain, habitat. Photo by Geoffrey Kitchener, 3 September 2013.

From the alignment of colonies at both Sheppey and Grain, it is possible to conclude that the species will tolerate quite close proximity to tidal water, but on south-facing sea wall slopes (as at the relatively sheltered Dray Bay on Sheppey and the southern Yantlet Creek site) or west-facing (as at the northern Yantlet Creek site, also sheltered to a degree); not on north-facing sea walls fully exposed to the Thames estuary. An analysis by Prince & Hare (1981) in relation to populations at Fobbing, Essex, across the estuary also confirmed that the species occurred mostly on south-facing slopes. This may be related to more effective autumn germination on south-facing slopes providing larger and better established plants, and perhaps also to a competitive advantage in being able to survive in dry, exposed conditions in hot summers[354]. However, Prince & Hare also refer to Essex south-facing slopes having less vegetative cover and hence presumably more open ground for seedling establishment; in Kent, some of the south-facing slopes indeed appear as though competitive growth may be affected by scorching, but equally there were slopes with this aspect with unsuitably dense vegetation, particularly where *Elymus* spp. (Couch-grasses) may have taken hold and left no scope for *Lactuca saligna* regeneration.

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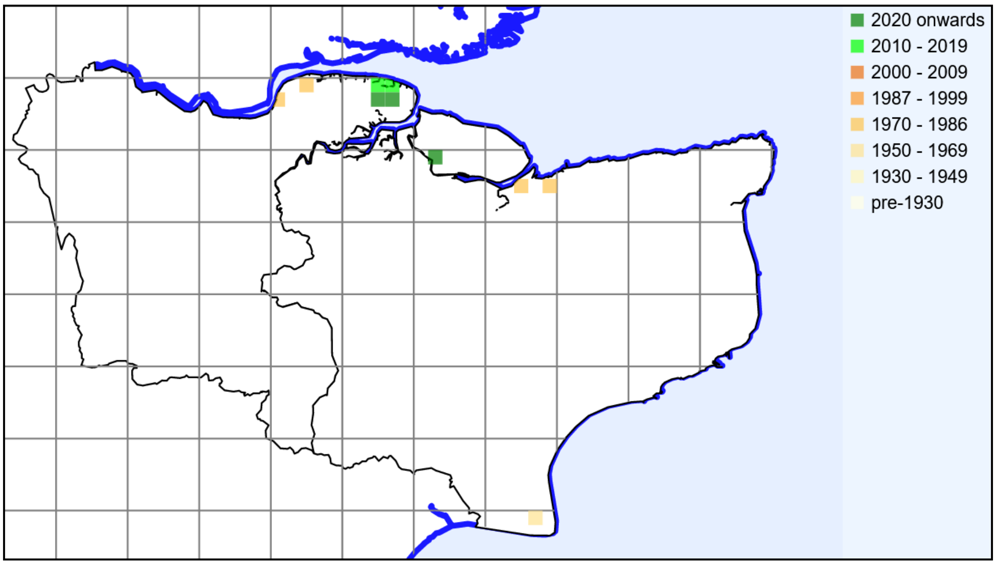
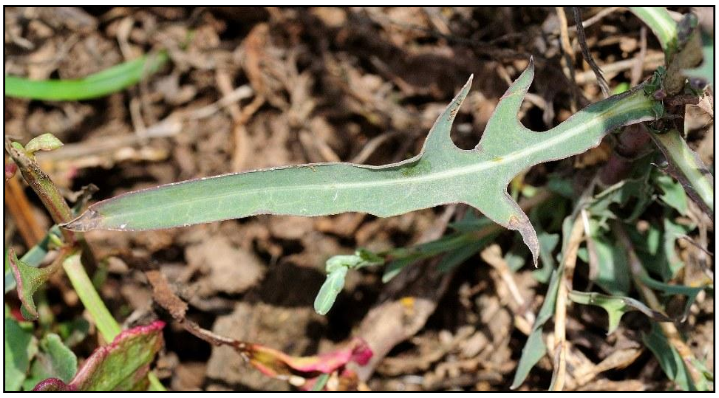
[354] Suggested by Adams, K.J. and Hare, A.D.R. (1999. Lactuca saligna L. (Asteraceae), in (ed.) Wiggington, M.J., *Vascular Red Data Books 1 Vascular Plants*, 3rd edition. J.N.C.C., Peterborough.

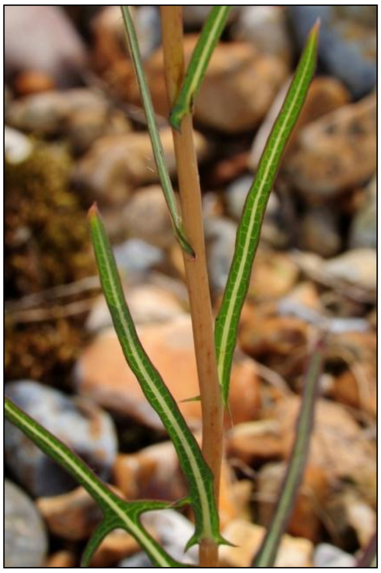


***Lactuca saligna* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Lactuca saligna is an over-wintering or spring-germinating annual, and accordingly dependent on the presence of open ground for establishment. By analogy with the short period of seed viability for *Lactuca serriola* (Prickly Lettuce), namely a half-life of between 1.5 and 3 years, Prince & Hare (1981) supposed that re-establishment from buried seeds of Least Lettuce would be unlikely even after one year. The removal of cattle grazing for a year could accordingly be damaging for the plant's survival. Additionally, the species is exposed to the potential for climate-related vulnerability by virtue of being at the northern limit of its European distribution. It may need the hot, dry summers obtaining in the core of its general distributional range, and extending to south east England; but severe or prolonged winters may kill off the large, autumn-germinating plants and early spring-germinating ones, the main germination period in Essex (and presumably, Kent) being November to January. This would leave the limited seed resource deriving from the small, later (up to May) spring-germinating plants. The species in Kent and its neighbouring counties therefore lacks resilience to catastrophe.

Sheppey. Photos by Lliam Rooney, 27 August 2013





Identifying Least Lettuce is principally a matter of distinguishing it from *Lactuca serriola* (Prickly Lettuce) and divided-leaved forms of *Sonchus oleraceus* (Smooth Sow-thistle). Least Lettuce has a narrower inflorescence than Prickly Lettuce, is more vertical in appearance, and its leaves are narrower, with a sagittate base, and the midrib below lacks the strong prickles of Prickly Lettuce; Smooth Sow-thistle has a totally different panicle (tending to a cymose umbel) and even its most divided-leaved forms do not have such long narrow leaves as those of Least Lettuce. Often just as difficult as seeing Least Lettuce where these other species may distract, is separating sight of it generally from surrounding vegetation, especially when very small. This is compounded when the flowers close up, which takes place from about 11 a.m. – it is perhaps not surprising that the species is self-pollinating.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Higham Marshes	TQ77C		After 1970, before 1981	GS, MHD & EGP, in Philp (1982)	
Cliffe Pools	TQ77D	SSSI	(1) 1978 (2) 1977 (3) After 1970, before 1981	(1) ADRH (2) SDP (3) AGS & EGP in Philp (1982)	(1) TQ 712 778. (2) TQ 710 778. on landward side of sea wall over c.100 yd stretch immediately east [north?] of where the track meets the sea wall…with *Bupleurum tenuissimum* and *Torilis nodosa*. (3) Recorded as TQ77D.
Cliffe Marshes	TQ77E	SSSI	After 1970, before 1981	AGS, in Philp (1982)	Lower Hope Point.
Cliffe/Cooling Marshes	TQ7479	SSSI	(1) 1978 (2) After 1970, before 1981	(1) ADRH (2) AGS & EGP in Philp (1982)	(1)TQ 747 792. (2) Recorded as TQ77P.
Allhallows Marshes	TQ8676	SSSI	(1) 15 July 2020 (2) 19 August 2018	(1) GK (2) DS	(1) Total 346 plants in open habitat maintained by clay cracking and cattle trampling: (a) south-facing upper slope of clay embankment (Yantlet Creek sea wall) at (i) TQ 85987 76673 (1 plant); (ii) TQ 86017 76678 (3); (iii) TQ 86260 76675 and westwards for 9m (175); (iv) TQ 86286 76673 (4); (v) TQ 86312 76674 (19); (vi) TQ 86319 76676 (1); (vii) TQ 86324 76676 (3); (viii) TQ 86361 76682 (6); (ix) TQ 86410 76690 (2); (x) TQ 86449 76698 and for 8m westwards (27); (xi) TQ 86451 76700 (16 plants). Associated spp for (a) included *Hordeum marinum, Plantago coronopus*. (b) south-east-facing (or SSE) upper slope of clay embankment (Yantlet Creek sea wall) at (i) TQ 86468 76705 (5 plants); (ii) TQ 86474 76704 (5); (iii) TQ 86477 76706 (9); (iv) TQ 86483 76709 (33); (v) TQ 86495 76714 (13); (vi) TQ 86522 76726 (10); TQ 86537 76734 (1 plant). Associated spp for (b) included *Bromus hordeaceus, Catapodium rigidum, Helminthotheca echioides, Lolium perenne, Hordeum marinum, Plantago lanceolata, Hordeum secalinum, Torilis nodosa, Plantago lanceolata, Elytrigia repens, Phleum bertolonii*. (c) east-facing upper slope of clay embankment (Yantlet Creek sea wall) at (i) TQ 86740 76933 (10 plants); (ii) TQ 86740 76939 (1); (iii) TQ 86744 76960 (1 plant). Associated spp for (c) included *Bromus hordeaceus, Helminthotheca echioides, Hordeum marinum, Lepidium draba, Lolium perenne*. (2) TQ 86516 76722. At least 20 non-flowering plants, recorder is fairly sure of having passed these in other nearby monads as well but without realising, until these were found.
Grain Marshes	TQ87P,U	SSSI	(1) 17 August 2017	(1)& (2) BBe	(1) TQ 87558 78286, three plants.

			(2) 28 July 2017 (3) 3 September 2013 (4) 2000 (5) 9 September 1999	(3) GK (4) Carter Ecological (5) EGP & DG	(2) TQ 86355 78446, one patch found with c.20 plants just in front of sea wall. (3)(a) 107 plants spread along about 85m of the Yantlet creek seawall, nearly all on the coastal slope. Fifteen plants were found on the west (creek-) facing wall from TQ 8584 7802 to TQ 8585 7802, on the upper parts of the clay slope, which was heavily poached by cattle with much broken, semi-open ground. 12 more plants were recorded in a similar habitat between TQ 85845 78027 and TQ 85848 78032. On the inland side of the seawall (east or south-east facing) were a further 8 plants at TQ 85897 78201. One plant each was noted on the west (creek-facing) side at TQ 85837 78052 and TQ 85836 78059. Between TQ 85833 78078 and TQ 85830 78092, there were 70 plants. (b) A total of 34 plants. At TQ 86440 78480 there was one plant, between TQ 86500 78512 and TQ 86508 78514, 16 plants, and between TQ 86567 78527 and TQ 86580 78528 there were 7, and at TQ 86602 78520 there were 10. All on the inland upper (south facing) slopes of the Thames estuary seawall, on cattle-poached clay. (4) Sea wall survey for Environment Agency. Two populations, one large and one small, in sites over a kilometre apart on the Isle of Grain. Grid references noted were TQ 8651 7851, TQ 8583 7813, TQ 8583 7803, TQ 8587 7794, TQ 9234 6910 and TQ 9242 6910. (5) Sea wall, TQ87P. There is also a record by FR for 1999 on Grain at TQ87, which may be the same.
The Dray, Kingsferry, Sheppey	TQ9269	SSSI	(1) 5 August 2021 (2) 1 June & 3 August 2019 (3) 2 August 2016 (4) 27 August 2013 (5) August-September 2000	(1) GK, AWi & LM (2) & (3) AWi (4) GK, LR & RG (5) ACH & RC	(1) Between TQ 92272 69111 (this is not as westerly as the colony was found to extend in 2012) and TQ 92422 69120 (fairly similar to 2012). The count of 1700 represents an average between two separate counts along the concrete batter of the Swale-facing seawall: one, by GK & AW, of 1599 plants and the other, by LM, of 1800 plants. Some uncertainty in counting may have arisen through difficulty in ascertaining if clustered multiple stems arose from one plant, or more. To this total should be added one plant in broken clay soil above the batter, and four plants landward of the sea wall in the vicinity of TQ 92430 69133. The absence of more landward plants, in spite of prevailing winds taking seed in that direction, was presumably due to the closed vegetation community. Risks to the colony include the possibility of embankment stabilisation works including the pouring of concrete over the existing batter, as seems to have happened to the west end

					of the colony between 2015 and 2018, which removes the cracks in which plants grow. (2) TQ9269. (3) TQ 923 691, 136 plants counted on Ferry Marshes seawall, Elmley NNR. (4) 1028 plants were counted, with individuals ranging from 3cm to 70cm high. The colony extended along about 190m of shoreline, scattered from TQ 92229 69095 to TQ 92434 69116. Plants were growing on the coastal (Swale) side of the sea wall, facing south and south-west. None was seen on the landward side, where vegetation was probably too dense. The lower parts of the seawall slope were stone, covered with concrete; the upper parts were vegetated London Clay. Most plants were centred at the junction of the clay upper slope with the lower concrete batter, and in cracks in the concrete. Some of the plants in the concrete descended well down the slope towards the area of marine influence. The species was also growing scattered on the upper clay slopes which were only lightly vegetated and where there was some cracking and crumbling - partly due to the angle of slope and the drying out of the clay, but also due to cattle-trampling. Associated species included: *Beta vulgaris* subsp. *maritima, Bromus hordeaceus, Bupleurum tenuissimum, Cynosurus cristatus, Dactylis glomerata, Helminthotheca echioides, Hordeum marinum, Lathyrus nissolia, Lolium perenne, Phleum bertolonii, Plantago lanceolata, Poa humilis, Potentilla reptans, Scorzoneroides autumnalis, Senecio erucifolius, Torilis nodosa*. (5) Part of an Environment Agency sea wall survey. North of the Swale along a rather dry and small/old section of bank at Dray Bay. In very sparse vegetation, dotted along quite a length (100m+ possibly) and including some 'patches' of more than isolated plants.
Cleve Marshes	TR0464		1979	EGP	Record is given as Seasalter, but with Cleve Marshes gridreference. It is probably the same as TR06M, 'Seasalter area' in Philp (1982), and is likely to be west of the Sportsman, where known to FR (possibly the same as FR's record at Graveney beach, 1945, although this may instead relate to the following TR0664 site).
Graveney Marshes	TR0664		19 September 1965	BW	Landward side of sea wall, including in its cracks, plus some plants on level below.
Seasalter	TR06X	SSSI	1979	EGP	TR 090 640 and TR 090 649. Also known to FR on the seawall, 1944.

Lathyrus aphaca L. (Yellow Vetchling)

vc 15 and 16

Rarity / scarcity status

Lathyrus aphaca occurs locally in southern England, especially the south east, and occurrences further north tend to be casual introductions. It is considered to be possibly native where there are persistent populations on calcareous ground, especially by coasts; but it may not be easy to differentiate from introduced origins, such as a contaminant of legume crops, as suggested in *Plant Atlas 2020*), where its status could be archaeophytic, or possibly also amenity sowings with seed mixes including legumes. Whilst it is widespread in Europe, north Africa and Asia, its presence in Belgium, The Netherlands and Germany at least is believed to be as an introduced species[355]. It is **nationally scarce** and is considered to be **Vulnerable** to the risk of extinction, both in England and Great Britain as a whole; in England its area of occupancy is taken to have declined by 31% in comparing records for the periods 1930-69 and 1987-99. In Kent, there appears to have been a decline of 40% between the surveys in Philp (1982) and Philp (2010), but this is not supported by subsequent recording, so that the species appears uncommon, rather than rare or scarce in the county. It is a Kent axiophyte and so is indicative of good habitat.

Springhead, near Ebbsfleet.
Photo by Geoffrey Kitchener, 4 June 2015

Account

The first Kent record for *Lathyrus aphaca* is by Thomas Johnson, who mentioned it as seen on the return leg of his second Kent journey, *Descriptio Itineris* (1632), from Faversham to Gravesend via Sittingbourne and Rochester. It is quite possible that he had seen it before then, but not mentioned it in either of his journey accounts, as Johnson was responsible for a 1633 revision of John Gerard's *Herball,* and there refers to the species as being 'in the corne fields about Dartford in Kent and some other places'. Whilst John Parkinson's *Theatrum Botanicum* (1640) has a higher reputation than Johnson's revision, its reference to *Lathyrus aphaca*, that 'It groweth in divers corne fields in *Kent*' adds nothing more, and may be derivative. The arable association may perhaps be indicative of introduction through seed contamination. Hanbury & Marshall (1899) gave relatively few records and regarded the species as a colonist or casual of fields, banks and roadsides, rare and seldom permanent. There are a few Victorian herbarium specimens from the Folkestone area, but not the range of finds that might be expected if the species were other than rare. The *Woolwich Surveys* (1909), which covered north west Kent, took the view that there were only very old and more than doubtful records. So, whilst the earliness of the seventeenth century citations would normally offer some support to a case for native occurrence, their references to cornfields do not suggest native habitat, and the other evidence is not particularly helpful to such a case.

Springhead, near Ebbsfleet. Photo by Lliam Rooney, 4 June 2015

There are specimens in **MNE** which include some from the 1950s and 960s, but not suggesting any discernible distribution pattern. Philp (1982) recorded presence in 20 tetrads, mostly in the Dartford/Swanscombe area, but also from Sandwich to St Margaret's-at-Cliffe – on dry banks, sea walls and waste ground. Yellow Vetchling was given as native (which is what the standard Floras then stated), ‘although perhaps introduced in some locations’. During the 1991-2005 survey (Philp, 2010), however, the species was not recorded at all in far eastern Kent, there was a thin scattering from the Medway Towns towards Maidstone, and a residual clump of records continuing in the Dartford/Swanscombe area. The total had then reduced to 12 tetrads, and the species was described as native without qualification, present usually on the chalk or near the coast. It is unclear whether this description represents a change of mind about the plant’s status.

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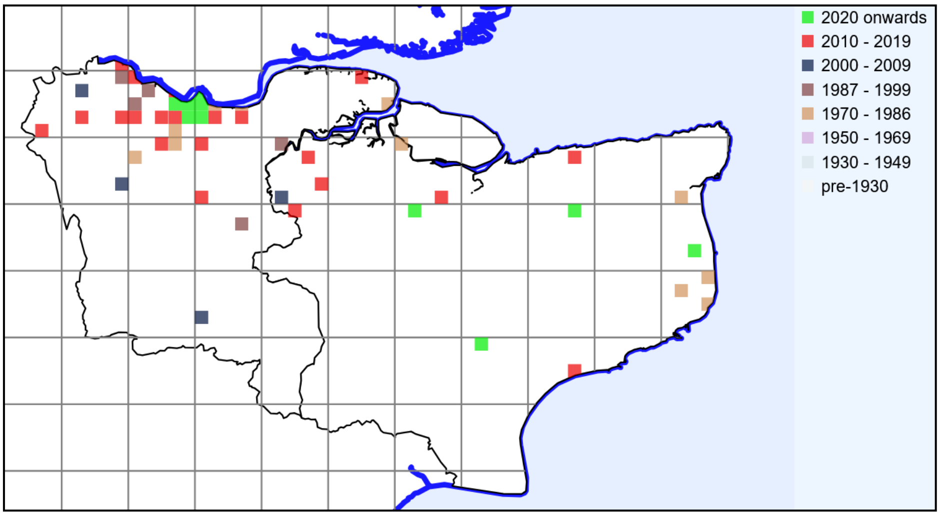
[355] Rumsey, F.J. (1994). *Lathyrus aphaca* L., in (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*. JNCC.

Even in the species’ core north west Kent area, the judgment is not easy to make. Roadside records may represent the continuance of old grassland or the mobility of a species which takes advantage of soil movement and opening up ground; but equally, it is a habitat where sowing after roadworks may have been undertaken. There are (2015-22) enormous quantities of Yellow Vetchling on the Swanscombe peninsula, with an air of wildness, but they are accompanied by much *Medicago sativa* (Lucerne) which may be indicative of general legume sowing. This area was historically saltmarsh, with levels changed by tipping and the operation of cement factories, so that the habitat is not persuasive of historic continuity for the species (but does not preclude the ability to move around from areas of longer establishment, especially as the nutrient-poor skeletal soils with highly alkaline conditions on the Swanscombe peninsula appear to suit the species but are slow to admit colonisation by competitors).

Equally, the large quantities around the HS1 rail link near the A2 south of Northfleet, accompanied by other legumes, may be indicative of sowing, given the major landscape changes in this area, although recognizing that some of these changes have been relatively recent and the species has been around there for at least forty years, even though one may not be able to trace back for another forty years before then. Rodney Burton remarked in the *Flora of the London Area* (1983) that ‘it is very abundant and persistent around Northfleet station, but it was not there at all 30 years ago’. Some of our recent records outside the core Dartford/Swanscombe area were under suspicion of deriving from wildflower sowing, but the species does not appear to be a constituent of the usual commercial wildflower seed mixes.

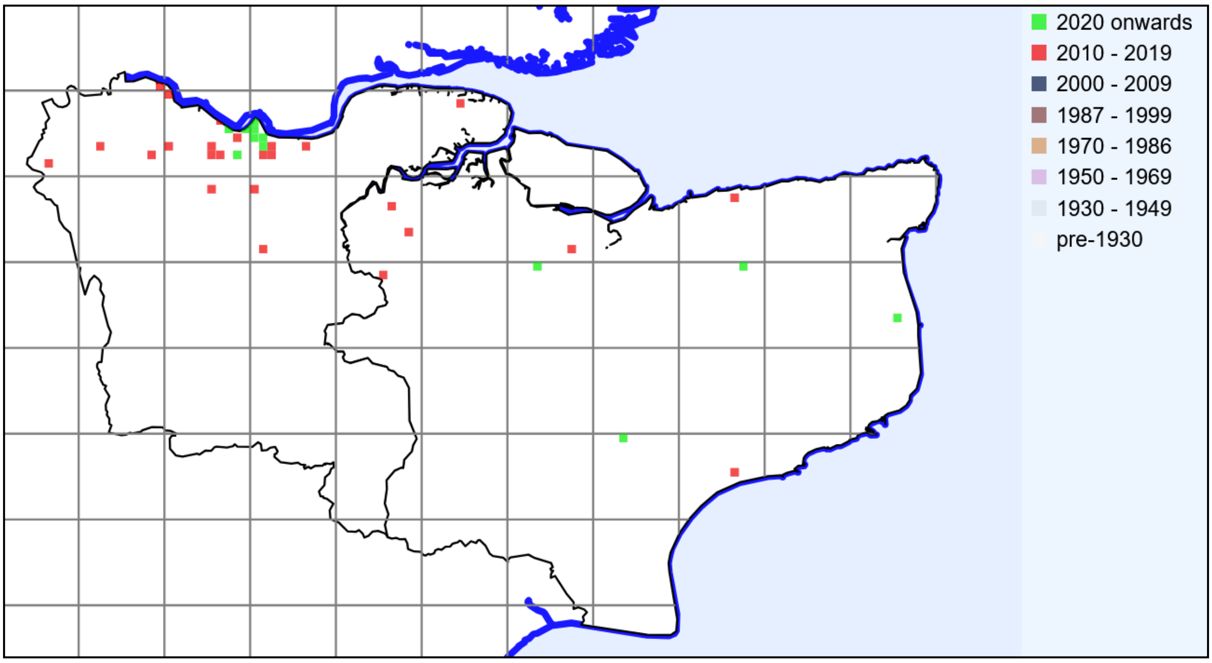


***Lathyrus aphaca* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Recording from 2010 to 2024 has brought totals back to, and has exceeded 1971-80 levels with records made in 31 tetrads (37 monads), mostly clustered near the Thames in north west Kent, as shown in the accompanying distribution map, but with a scattering in East Kent, which Philp (2010) did not have. The data match the 1971-80 records better than the 1991-2005 survey (especially if six tetrads are discounted as being in Greater London, which Eric Philp did not cover) so that the latter likely represents under-recording.

Lathyrus aphaca is an autumn-germinating annual, flowering from May to August. As an annual, it requires a degree of openness in its habitat to reproduce. The seeds are not wind-dispersed and may be expected to fall within range of the parent, despite which there appears to be a degree of mobility in its occurrence. Germination can be at a range of temperatures from 5°C upwards; it is not reliant upon light, but maximum emergence is from seed buried at 1cm, with three times less (and then delayed) at 8cm[356]. We can trace no information on any seed-bank, but legumes including *Lathyrus* generally have long-term seed viability. Associated species which we have noted in Kent include *Anacamptis pyramidalis* (Pyramidal Orchid), *Lathyrus nissolia* (Grass Vetchling), *Orchis anthropophora* (Man Orchid) and *Vicia sativa* (Common Vetch).

The previous distribution map, at tetrad resolution, emphasised change in terms of losses (although losses may not be the most appropriate term in respectof what appears to be a fairly mobile species) by inclusion of older data. The map below, at monad resolution, emphasises current records (as monad recording only became the norm in Kent from 2010) and provides a more detailed picture of the present position.



***Lathyrus aphaca* Kent records to 2024 mapped at monad level, from BSBI database.**

Lathyrus aphaca is a distinctive plant by virtue of its yellow flowers, and the large, hastate stipules which function as leaves paired up the stem (the true leaves have been reduced to a tendril).

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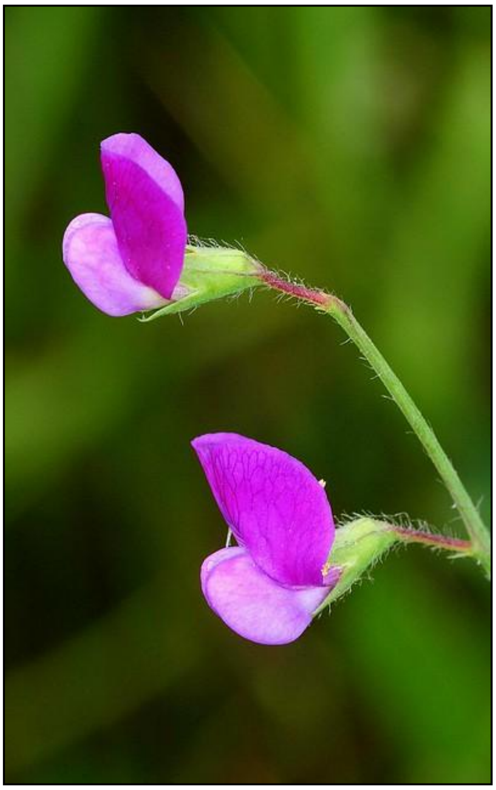
[356] Kumari, A., Singh, K., Yadav, A. & Singh, S. (2010). Factors affecting seed germination of *Convolvulus arvensis* and *Lathyrus aphaca*. *Indian Journal of Weed Science* **42**: 203-211.

Lathyrus hirsutus L. (Hairy Vetchling)

vc 15 and 16

Rarity / scarcity status

Lathyrus hirsutus grows very scattered in England, the Channel Islands, east Ireland and southern Scotland as a casual introduction, but populations close to the Thames estuary in Essex and Kent were assigned a more permanent status in Rumsey (2019)[357], which has resulted in the species being brought onto the Red Plant List for Great Britain, with a status of **Vulnerable** to the risk of extinction, so far as concerns that limited putative native range. It is **nationally rare**, and in Kent it is **scarce**, with its populations enjoying national signifiacnce.



Warden. Photo by Lliam Rooney, 18 June 2013

Account

The first Kent record is in 1875, when found by William Fawcett growing in a wood along a Southborough roadside for about 40 yards and for about 10 yards into the wood (*Journal of Botany* (1878) **16**: 247), in company with other legumes, namely *Vicia gracilis* (*Ervum gracile* = *Vicia parviflora*, Slender Tare), *Lathyrus nissolia* (Grass Vetchling) and *Vicia hirsuta* (*Ervilia hirsuta*, Hairy Tare) and increasing in extent over the next three years. Hanbury & Marshall (1899) cite the view of E.M. Holmes that it was truly wild here, but give the status of the species as 'Native?'. It is an intriguing record, partly because of the extension into woodland, which is not an expected habitat, and must have been very open; but also partly because of the association with other legumes, in particular the rare *Ervum gracile*, if correctly identified. The presence of two such rare legumes would suggest either a very special habitat, not replicated elsewhere in the county, or an introduction; the latter is more likely.

It was the only record cited by Hanbury & Marshall (1899); and the next one appears to be in 1903, by F. Hewett at Ramsgate (specimen in **SLBI**). The same day, Hewett also collected at Ramsgate the rare casual *Vicia hybrida* (specimen also in **SLBI**), so that it is at least possible that these were found together. The latter's herbarium label gives no more detail, but George Pittock noted[358] that Hewett found it earlier in the year on waste ground near the South Eastern Railway Company's Ramsgate Station. The likelihood is that both species were casual introductions. Intriguingly, *Lathyrus hirsutus* was also at railway goods sidings, at Richborough Port, in 1936 (collected by J.E. Lousley, specimen in **SLBI**) where it continued to be seen at least until 1987; it is likely that it was introduced with goods traffic use. There is a further early record, in 1913 at Markbeech, by Mr Justice G.J. Talbot of Falconhurst, backed by a specimen at Royal Botanic Gardens Edinburgh herbarium and likely to have been found on his estate. Nothing more is known of this; an introduction seems likely.

It is not until Philp (1982) that north Kent coastal or estuarial occurrences began to be noted, with one or two plants at the edge of saltmarsh at Leysdown, Sheppey, described as 'probably introduced'. In Philp (2010), reflecting a record from 1994, the species is given as introduced but well established, in rough grassland at

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[357] Rumsey, F. (2019). *Lathyrus hirsutus* L. Native or not... and should it really matter? *BSBI News* **140**: 16-20.

[358] In his copy of Hanbury and Marshall (1899), now in the possession of John Badmin.

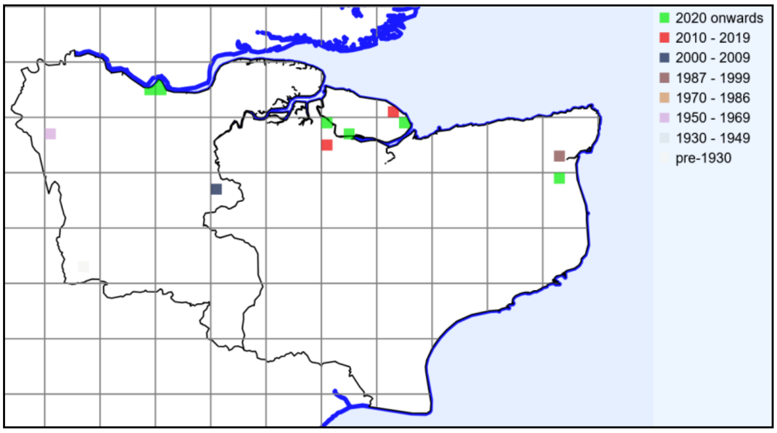
Warden Bay; at least 1,000 plants were present in 2007, and its presence in the area has continued, at least until 2021. Other north Kent coastal or estuarial occurrences have been at Botany Marshes, Swanscombe (where it is abundant and widespread, 2022, recorded since 2012); at Church Marshes, Sittingbourne (in 2014 and 2017, in separate monads by a sea wall along Milton Creek); at Kingsferry (in 2018, on the sea defence bank along the Swale); at Monk's Wall near Sandwich in 2021. Swanscombe is perhaps the most remarkable location, Hairy Vetchling being spread over five monads in semi-natural grassland, part calcareous, part London Clay. All these coastal/estuarial occurrences share in common, as well as geography, an association with London Clay grassland in (semi-) natural situations.

Swanscombe. Photo by David Steere, 23 August 2019

The Kent occurrences may be considered with the case made in Rumsey (2019) for the species having long-term status by the Thames estuary, possibly native (and at any rate, behaving as a native) or possibly appearing as a seed contaminant in the course of marshland reclamation in the mid-11th to 14th centuries. That case is based on the unique climate in the region: the most continental area of Britain; the driest part of the country with frequent soil-water deficit from May to August; one of the warmest parts of the country in summer; a mild climate through the influence of the Thames. These factors help naturally maintain an open habitat, allowing the persistence of annual species. The south Essex sites are in fairly coarse natural grassland in transition to scrub on roughly neutral London Clay soils that dry out and crack in summer, not far from the coast. They have a historical background, in that Christopher Merrett (in his *Pinax rerum naturalium Britannicarum*, 1666) first recorded it at 'Hadley Castle', presumably the south-facing slopes of the Benfleet-Hadleigh Downs overlooking marshlands by the Thames. Equivalent Kent records have nothing like this antiquity, so any case for very long term presence on the Kent side Thames estuary would have to proceed on the basis of being overlooked.

Kemsley, Sittingbourne. Photo by Danny Chesterman, 22 June 2017

The Thames-related distribution, however, is the only coherent geographical and habitat-related distribution in Kent, subject to the Sandwich records, to the extent that these enjoy a habitat of old defence banks against tidally influenced flooding. The remaining records, mentioned above for 1875-1913, are likely to have an introduced origin, to which may be added a sighting at Ditton Quarry (2005), a location which seems to have acquired a number of introductions in the course of becoming a local nature reserve.



***Lathyrus hirsutus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Records for 2010-24 amount to nine tetrads (15 monads), in comparison with only one tetrad each for the sutveys of 1971-80 and 1991-2005 (Philp, 1982 and 2010).

Lathyrus hirsutus is a scrambling annual, native in central and northern Europe, as also north Africa and Asia, and introduced elsewhere. Where introduced in the British Isles the main sources appear to be as a seed contaminant and a bird seed alien. It has paired leaflets and a winged stem: the flowers are notable as having a bluish-red standard petal, fading through blue to greenish blue, and pale blue wing petals, fading to greenish blue. In spite of the name '*hirsutus*', the plant is more or less glabrous; but the fruits are densely hairy.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Swanscombe	TQ5975	SSSI	23 July 2022	GK	TQ 59722 75615, several dried-up plants in fruit on stones deposited on seawall.
Between Hartley & Fawkham	TQ66D		1 July 1983	JRP	Very large quantity on open chalk scrub slope, see *BSBI News* (1983) **34**: 9. Still present, 1992.
Swanscombe	TQ6075	SSSI	(1) 6 July 2022 (2) 23 August 2019 (3) 21 August 2015 (4) 27 August 2012	(1) GK (2) DS (3) & (4) GK	(1) (a) TQ 60942 75810, three plants in grassland by path, north of Botany Marshes and at higher level, also to north west in scrubby grassland at TQ 60929 75833 plus one at TQ 60858 75867 and another at TQ 60810 75941. (b) Grassy areas by path, TQ 60869 75655, one plant, and TQ 60981 75742, six plants. (c) Widespread in Botany Marshes area, e.g. at TQ 60988 75585, where numerous in semi-open area near scrub and reeds. (2) Hundreds of gone to seed plants c. TQ 608 759 with a few still in flower sufficient to confirm identity. Also c. TQ 609 758. (3) TQ 6085 7583, a large patch in coarse grassland. (4) TQ 60927 75810, four plants in turf between wheel ruts on track between embankment and Botany Marshes, in flower and fruit. Some saline influence from estuary.
Swanscombe	TQ6076	SSSI	(1) 13 July 2022	(1) GK	(1) TQ 608 760.

			(2) 6 July 2022 (3) 23 August 2019	(2) GK (3) DS	(2) Scrubby calcareous grassland at TQ 60707 76079. (3) Hundreds of gone to seed plants with a few still in flower sufficient to confirm identity c. TQ 609 761 to TQ 608 760.
Swanscombe	TQ6175	SSSI	6 July 2022	GK	Abundant and widespread in grassy field west of Manor Way, e.g. at and around TQ 61086 75569, where there were c.25 sprawling clumps including 4x2 metres, also noted, same field, at TQ 61079 75618.
Swanscombe	TQ6176	SSSI	23 August 2019	DS	Hundreds of gone to seed plants c. TQ 610 761 with a few still in flower sufficient to confirm identity.
Ditton Quarry	TQ7157	Local nature reserve owned and managed by Ditton PaPrish Council	20 June 2005	JL	A single plant in grassland at base of former ragstone quarry.
Sittingbourne, Milton Creek	TQ9164, TQ9165		(1) 22 June 2017 (2) 25 June 2014	(1) DC (2) CO	(1) TQ 919 656, for 200 yards along sea wall towards Paper Mill. (2) TQ9164, Along creek embankment near sewage works, locally abundant.
Kingsferry	TQ9168, TQ9169	SSSI	(1) 28 August 2020 (2) July 2018	(1) DCh (2) AY	(1) TQ 918 687, one plant in flower and fruit below sea wall. (2) TQ 910 695 approx, in the middle of the footpath on the estuary defence embankment a few hundred yards from the Sheppey crossing, two small clumps with a few plants in each.
Elmley Marshes	TQ9567		5 August 2024	AL	TQ 9572 6719.Elmley. One large patch near the path.
Sandwich, north west	TR3258		11 July 2020	DCh	TR 324 588, Monks Wall, large patches along 100 yd stretch of old seawall.
Sandwich, north west	TR3259		22 July 2021	KC	A large patch of plants about 3 x 3m at TR 3230 5932, on the river wall, almost under the A256 flyover bridge. Scattered plant continuing on the bank and into the next monad where recorded in 2020.
Richborough	TR3362		(1) 15 July 1987 (2) 11 July 1986	(1) EGP, RoF (2) RoF	(1) TR 335 620. (2) TR 334 620.
Leysdown	TR 0469	Coastal park	26 August 2021	DCh	TR 042 697, several large clumps at southern end of coastal park.
Warden/ Leysdown	TR07F	Part SSSI	(1) 19 August 2018 (2) 13 August 2018 (3) 18 June 2013 (4) 24 July 2007 (5) 1991-98	(1) BS, MP (2) KBRG meeting (3) JA, LR (4) EGP, GK (5) EGP	(1) (a) TR 0244 7160, a couple of flowering plants. (b) TR 022 719, locally frequent. (2) TR 0244 7161, grassy area sloping from sea wall down to dyke. (3) TR 02294 71905, grassy area above Warden Bay. (4) TR0271, at least a thousand plants widespread in coastal grassland. (5) TR07F

Habitat, Swanscombe. Photo by David Steere, 23 August 2019

Lathyrus japonicus Willd. (Sea Pea)

vc 15

Rarity / scarcity status

Sea Pea is not infrequent on shingle beaches in the south and east of England and also has a presence on the south coast of Ireland, being very scattered and local elsewhere in the British Isles. Its restricted habitat and range means that it is **nationally scarce**, but as its populations are generally stable, its conservation risk status is regarded as of 'Least Concern', both in England and Great Britain as a whole. It is not known in West Kent, and in East Kent it is **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Dungeness. Photo by Heather Silk, 8 May 2011

Account

The first printed Kent record for Sea Pea is in John Parkinson's *Theatrum botanicum* (1640) as growing 'neere *Rumney*'. He also mentions another sort of Sea-pea (which does not seem separable) 'at *Gilford*, in Kent, over against the *Comber*', which is more likely to be in East Sussex. Gilford is the pronunciation for Guldeford, and Comber would have been equivalent to the Camber, a large bay which became reclaimed and silted-up behind present-day Camber village. Early records run from Sandwich to Kingsdown, and then New Romney, Lydd and Dungeness; but Hanbury & Marshall (1899) considered that it was very rare, seemingly extinct at some of the old stations, although it might perhaps be found at Dungeness and Kingsdown in small quantity. Records have indeed continued to be made from those locations.

Lathyrus japonicus was first found on the north Kent coast by Francis Rose, who collected material in 1949 from a shingle beach at Plumpudding island, west of Birchington, and from a beach north east of Shuart (these may be the same location, as also on a shingle beach, St Nicholas at Wade, 1962). It was thought that, from being 'in local plenty' in the 1960s, it had been eliminated due to inroads by the sea and the erection of a new sea wall (Randall, 1977)[359]. However, there have been sporadic finds to follow, and Philp (1982) gave two north coast records, as well as at Kingsdown, Hythe and Dungeness, to produce a total of eight tetrad records in the county for the 1971-80 survey.

The total of nine records for the 1991-2005 survey (Philp, 2010) suggests stability, but only five of those were for identical tetrads, and of the others, Sea-pea had now been found on Sheppey, at Leysdown-on-Sea. Similarly, the records for 2010-24 (comprising nine tetrads, equivalent to ten monads) are not fully coincidental with those for 1971-80 or 1991-2005: they include three tetrads which feature in neither of the previous surveys. The implication seems to be, subject to the relative completeness of each survey, that within the limits imposed by suitable habitat, Sea Pea is fairly mobile in its occurrences within parts of east Kent.

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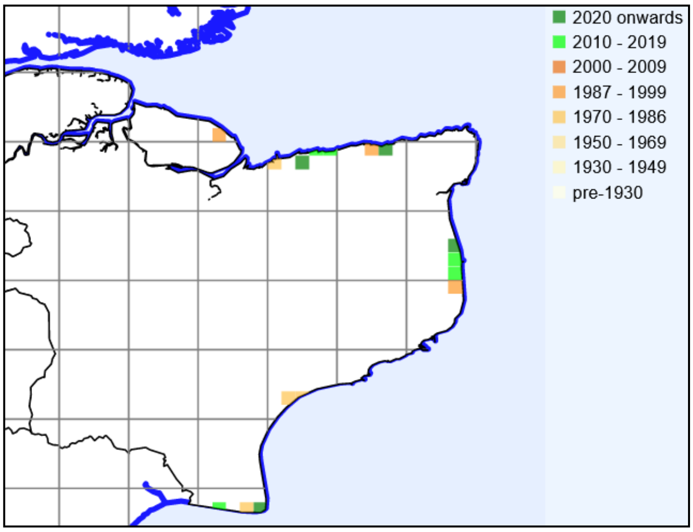
[359] Randall, R.E. (1977). The past and present status and distribution of Sea Pea. *Lathyrus japonicus* Willd., in the British Isles. *Watsonia* **11**: 247-251.



***Lathyrus japonicus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

This is against a background of considerable continuity in at least the Walmer/Kingsdown and Dungeness populations. The former was present at least by 1801, when Lewis Dillwyn read to the Linnean Society his *Catalogue of the more rare Plants found in the Environs of Dover, with occasional Remarks*[360], with a reference to Sea Pea 'On the beach between Walmer Castle and Kingsdown'. The Dungeness population was recognized in the 1695 and subsequent editions of Camden's *Britannia*; and that of 1701 states 'From hence the Shore turning, goes directly Westward, and has a sort of Pease which grows in great Plenty, and naturally amongst the Pebbles, in large Bunches like Grapes, in Taste, differing very little from Field-Pease'. Randall (1977) mentions that 'East of Dungeness power station, E. Kent, there is a colony which has increased considerably between 1946 and 1973, though two other colonies nearby known in the 1940s have now apparently disappeared'.

Deal. Photo by Sue Buckingham, 2011

There are still large quantities present at Dungeness – see table below. The series of Dungeness patches present in 2015 have been there, more or less as they are, for the previous 20 years or so without getting any bigger and, if anything, they were becoming weaker and more straggly, with discoloured leaves (Owen Leyshon, personal communication). The easternmost of this grouping is a patch behind the new lighthouse, c. TR 096 168, and there have been no recent records for the 6km stretch of shingle coastline running northwards towards Greatstone, which seems surprising, particularly in view of the considerable accretion of shingle in recent winters in the lifeboat station area and the absence of sea defence works here. Further north, at Hythe Ranges, there have been significant sea defence works in the previous 20 years which have severely reduced the ability for strandline vegetation to expand here.

It is a perennial of bare or semi-vegetated shingle beaches. Small populations may be susceptible to trampling where there is pressure of beach visitors[361]. It is said that the species is capable of growing on sand, but our Kent observations have been in relation to plants in the usual bare shingle habitat, sometimes where plentiful extending in a zone along a shingle bank or ridge, always above high tide mark. Zoned bands, 50m long (at Walmer) and 100m long (near Birchington) have been noted. The plants are often unaccompanied, being the first colonists of the shingle, penetrating it with their deep tap root, which may grow to 2m; but the decay of its foliage can result in organic matter accumulating within a Sea Pea patch, so as open the way for colonisation by other shingle plants.[362]

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[360] L.W. Dillwyn, in (1802) *The Transactions of the Linnean Society of London* **6**: 177-184.

[361] Akeroyd, J.R. (1994). *Lathyrus japonicus* Willd., in (eds. Stewart, A., Pearman, D.A. & Preston, C.D.) *Scarce Plants in Britain,* JNCC.

Although growing above high tide mark, plants need to be within reach of storm surges to enable sea dispersal, although it may be that wind dispersal accounts for some local spread.

Dungeness. Photo by Daphne Mills, 9 July 2015

It is not a species which is readily capable of confusion with any other.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Dungeness	TR01Y, includes TR0916	SSSI	(1) 26 June 2022 (2) 30 August 2018 (3) 3 July 2011 (4) 4 June 2011 (5) 30 September 2010 (6) 27 June 1996 (7) After 1970, before 1981	(1) KBRG / WFS meeting (2) OL (3) & (4) TI (5) SB (6) EGP (Philp, 2010) (7) Philp (1982)	(1) At TR 0946 1688 with *Crambe maritima.* (2) TR 09424 16760. New plant out on the storm ridge driftline vegetation zone. Multiple small patches dotted around near the Boardwalk which are known. (3) TR 09017 16677. An isolated population of 120 plants west of others, by old coastguard tower. (4) TR 09195 16744 to TR 09480 16884 (E-W, each side of boardwalk). 2490 plants, most on bare shingle. Plants furthest from sea very sparse and leaves discoloured. (5) TR 09284 16818, Plants spread over area of shingle, 7m x 2m. (6) & (7) Recorded as TR01Y.
Lydd Ranges	TR0217	SSSI	(1) 22 August 2024 (2) 3 September 2017 (3) 7 August 2012	(1) AL & RD (2) BBe (3) TI	(1) TR02591741. Denge Beach, SD1 *Glaucium flavum* community. (2) TR 02575 17388, 10 x 6m patch. (3)–Present.
Leysdown-on-Sea	TR07F		1991-1999	EGP (Philp, 2010)	
Seasalter	TR0965		21 April 1995	AW	Sherrins Alley, TR 097 657.
Hythe	TR13G		After 1970, before 1981	Philp (1982)	
Hythe Ranges	TR13L		After 1970, before 1981	Philp (1982)	

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[362] Brightmore, D & White, P.H.F. (1963). *Lathyrus japonicus* Willd. Biological Flora of the British Isles, *Journal of Ecology* **51**:795-801.

Whitstable	TR16D		After 1970, before 1981	Philp (1982)	
Swalecliffe	TR1467	SSSI	(1) 22 May 2017 (2) 31 July 2014	(1) & (2) CO	(1) One patch still present as before. (2) One patch on middle beach at c. TR 145 677, about 2 sq. m.
West of Herne Bay	TR1668		(1) 30 July 2017 (2) 21 July 2014	(1) & (2) CO	(1) One patch still present as before. (2) One patch on middle beach at TR 1615 6825, about 1 sq. m.
North of Beltinge	TR1968	SSSI	(1) 3 May 2014 (2) 31 August 2013 (3) 23 July 2012 (4) 19 August 2011 (5) 4 September 2009	(1) -(5), CO	(1) As below, six small plants. (2) As below, now covering over 1 sq.m. Very sparse and well eaten but spreading, no flowers this year, six plantlets present. (3) As below, now a small patch less than 1 sq.ft., but flowering (4) At c.TR 198 686, three plants in eastern rocky bay; one pod seen. (5) At c.TR 198 686 in eastern of three bays containing sea defence boulders. No flowers and possibly first year. 1-2 small plants.
Wade Marshes	TR26P		1991-98	EGP (Philp, 2010)	
West of Birchington	TR26U	SSSI	(1) 1 July 2013 (2) 30 September 2010 (3) 1991-98 (4) After 1970, before 1981	(1) CO (2) SB (3) EGP (Philp, 2010) 4) Philp (1982)	(1) All over shingle between lagoon and sea. Also, spread west of lagoon along top of shingle beach. Abundant. (2) (a) TR 26559 69200 to TR 26667 69206, a 100 m long stretch of plants between these two grid references, all along top of a shingle bank which protects a small salt marsh. (b) TR26430 69205, 50 metre long stretch of plants at top of shingle beach - estimated 150 plants. (3) & (4) Recorded as TR26U.
Kingsdown	TR34U		(1) 1991-98 (2) After 1970, before 1981	(1) EGP (Philp, 2010) ( ) Philp (1982)	
Kingsdown	TR34Z		(1) 24 September 1999 (2) After 1970, before 1981	(1) EGP (Philp, 2010) (2) Philp (1982)	
Walmer	TR35Q		(1) 2 May 2015 (2) 17 October 2011 (3) 16 August 2011 (4) 16 July 2011 (5) 23 July 2010 (6) 1991-98 (7) After 1970, before 1981	(1) KFC meeting (2) & (3) SB (4) KBRG meeting (5) SC (6)EGP (Philp, 2010) (7) Philp (1982)	(1) TQ3750. (2) (a) >10 large patches of plants on shingle ridge from TR 37904 50477 north to TR 37868 50761. (b) Patch of plants 12m x 6m, somewhat swamped by *Centranthus ruber* and *Arrhenatherum elatius.* (3) 15 patches of plants on shingle beach from TR 37850 51899 to TR 37855 51997, the largest containing more than 100 plants. (4) (a) Large numbers of plants forming a band on top of shingle beach between TR 37924 50370 and TR 37914 50402. (b) Top of shingle beach at TR 37931 50302. (5) TR 379 503, extensive on beach, between castles. (6) & (7) Recorded as TR35Q.
Deal	TQ35R	SSSI	(1) 29 October 2011 (2) 16 August 2011 (3) 12 June 1999	(1) & (2) SB (3)EGP & JBe (Philp, 2010)	(1) Patch about 1 sq. m. on high shingle ridge above sea, TR 37165 55539. Also three small plants at top of shingle beach, TR 37354 55032. (2) Patch covering 10m x 10m of

					shingle beach, TR 37852 52045. Also three patches of plants on shingle, TR 3785 5202. (3) Recorded as TR35R.
Deal	TQ35S		4 August 2000	EGP & PH (Philp, 2010)	

Deal. Photo by Sue Buckingham, 2011

Lathyrus linifolius (Reichard) Bässler (Bitter-vetch)

vc 15 and 16

Rarity / scarcity status

Lathyrus linifolius is widespread in the British Isles, in wood-borders and hedgerows, although absent from East Anglia and central Ireland. In Great Britain as a whole its conservation risk status is regarded as one of 'Least Concern', but in England the rate of its decline is such that it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 29% in the likelihood of recording the species. A decline, albeit over a different period, is also shown by Kent data, the number of recorded tetrads having dropped by 63% between 1971-80 and 1991-2005. The species is still not sufficiently uncommon in Kent to merit being designated as rare or scarce, but the apparent rate of decline is concerning. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first Kent record for *Lathyrus linifolius* is by John Ray, in his *Catalogus Plantarum Angliae* (1670), where he writes of Wood-pease or Heath-pease 'In sylvis & dumetis Cantii'[363] [in woods and thickets of Kent]. Other old records treat it as common, e.g. Edward Jacob's *Plantae Favershamienses*, 1777 (*In* Jud's Wood – *very common'*); Thomas Forster's *Flora Tonbrigensis* 1816 ('In woods, common'); (Gerard Smith's manuscript notes 1830-33 ('Upon the clay cap of the chalk, at Stowting, etc. The variety of this plant with linear elongate leaves occurs in North Kent, and upon Seal heath, between Wrotham & Riverhead'). Hanbury & Marshall (1899) assessed the species as very common, particularly in the Wealden districts, in woods, copses and bushy places.

Fishpond Wood near Dunkirk. All photos by Lliam Rooney, 23 April 2011

Bitter-vetch remained locally frequent at woodland edges and rides, and in sheltered roadside banks, particularly on the more sandy soils, until the 1971-80 survey in Philp (1982), when it was found in 167 tetrads. However, the 1991-2005 survey (Philp, 2010) produced only 62 tetrads, still with a clear woodlands association but largely retreating to the area around Canterbury and Wealden south west Kent. The reasons for decline are not apparent, but the decline itself is shared with other species of fairly infertile soils. It is possible that its habitat on low-nutrient lane-banks is affected by the pressures of increased traffic, and by competitive growth encouraged by nitrogen deposition. Our 2010-24 records have amounted to 72 tetrads (82 monads), but five of these tetrads are in Greater London, which was not covered by Philp (1982 and 2010), so that the decline may have levelled off. On the other hand, if increased traffic has contributed to losses, then we have no reason to suppose that those pressures are not continuing, with the number of vehicles on Kent's roads increasing by 14.3% between 2006 and 2016.[364]

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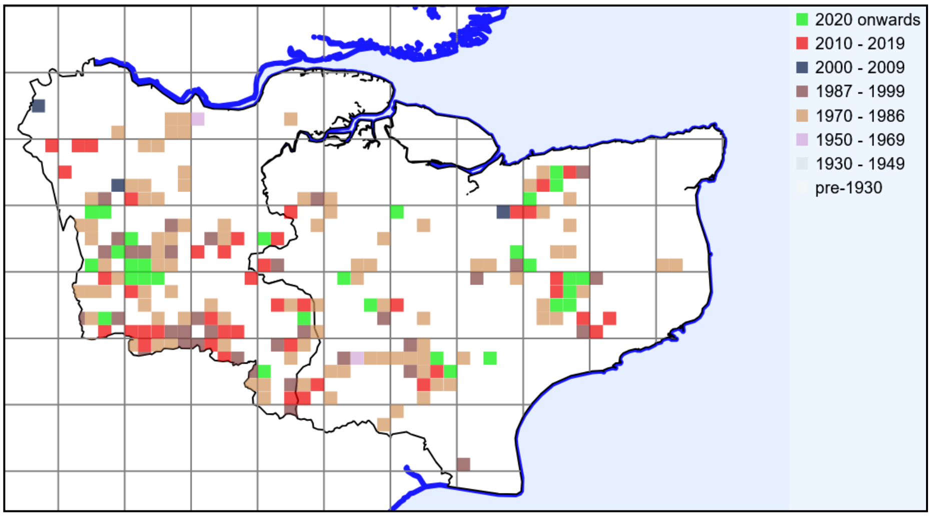
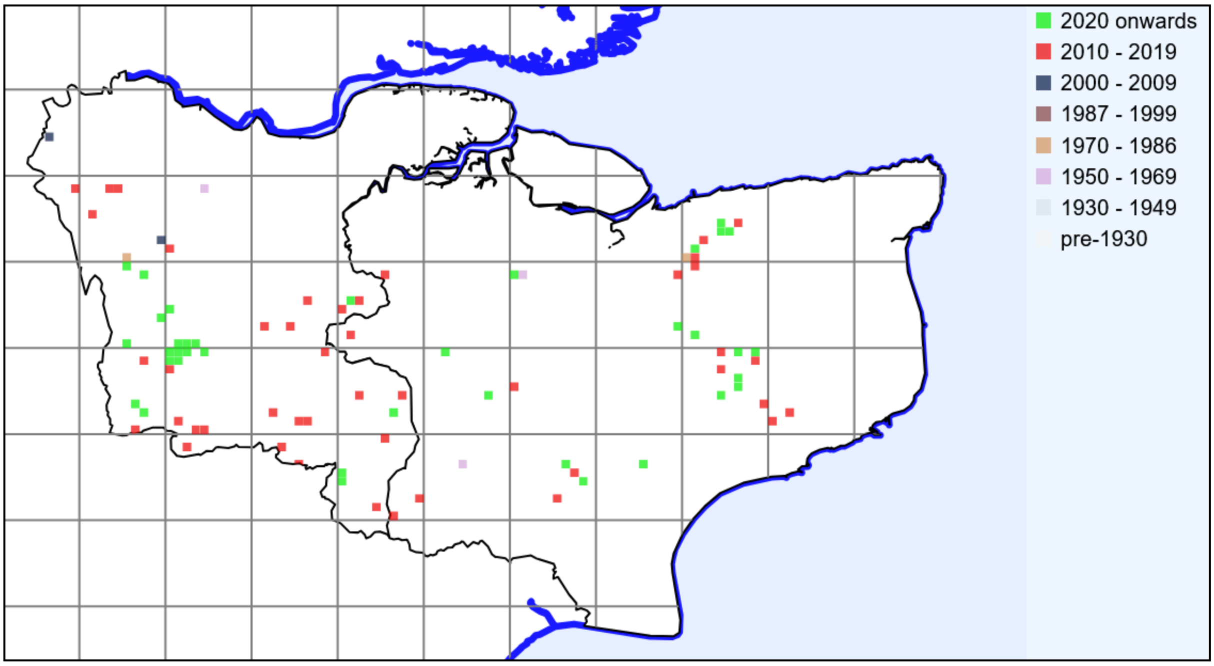
[363] There seems to be some confusion in Hanbury &Marshall (1899), where they give the date of Ray's *Catalogus Plantarum*, first edition, as 1673, which is actually the date of Ray's *Catalogus Stirpium in Exteris Regionibus* instead. The Latin extract has also been mangled – 'spumetis' [foaming] instead of '& dumetis'.



***Lathyrus linifolius* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The scale of loss after the 1970s depicted by the tetrad distribution map is remarkable and applies to all parts of the plant's range; there are 14 hectads in which it can no longer be found at all in Kent and most others show depletion. The following map at monad level shows the current position at higher resolution; it lacks older records as monad recording only became the norm in Kent from 2010. It affirms Bitter-vetch as now being primarily a Wealden plant, although there are East Kent concentrations around the infertile soils of the Blean and on the back of the Downs around the Elham valley.



***Lathyrus linifolius* Kent records to 2024 mapped at monad level, from BSBI database.**

Recent records have mostly been on roadsides or banks passing through woodland, but have also been in other marginal situations with woodland shading, carrying some exposure, such as by woodland rides or tracks or a woodland edge. The species is regarded as an ancient woodland indicator. There is insufficient heathland in the county to afford significant alternative habitat for it.

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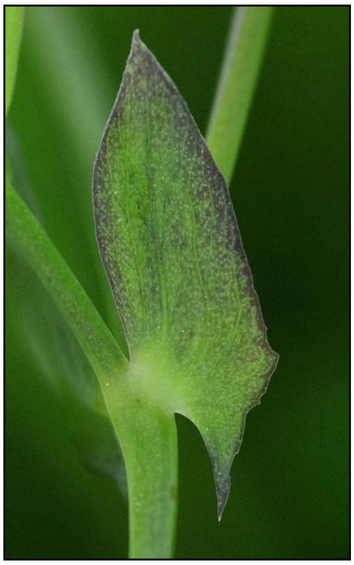
[364] *The State of Nature in Kent 2021* (2022). Report compiled by Kent Wildlife Trust. https://kentnature.org.uk/wp-content/uploads/2022/07/State-of-Nature-in-Kent-2021-Chapter-2-Headlines-and-key-findings-FINAL.pdf

The species has been treated as giving rise to three varieties: var. *montanus* (our usual plant); var. *variifolius* (of which no Kent records have been traced); and var. *linifolius* (a narrow-leaved form, with a number of records in Hanbury & Marshall (1899) under *L. montanus b. tenuifolius*, including note of a herbarium specimen gathered by Gerard Smith, which is likely to correspond with the latter's note of a variety at Seal, mentioned above).

Lathyrus linifolius may be recognized as having a winged stem (as distinct from merely angled) and 2-4 pairs of narrow leaflets with a small point at the end of the leaf stalk instead of a tendril. It often grows in similar habitats, but not so wide-ranging, as another purple pea-flower, *Vicia sepium* (Bush Vetch). The latter has more, wider and blunter leaflets, branching tendrils and smaller, half arrow-shaped stipules.



Lathyrus linifolius stipule. Photo by Lliam Rooney, 23 April 2011

Lepidium campestre (L.) W.T. Aiton (Field Pepperwort)

vc 15 and 16

Rarity / scarcity status

Field Pepperwort is an archaeophyte, or ancient introduction (although the evidence for this appears limited, except for its association with arable cultivation), scattered but locally common in the British Isles, less frequent in the north and west including Ireland. Whilst its conservation risk status is one of 'Least Concern' in Great Britain as a whole, in England the rate of its decline is such that it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 21% in the likelihood of recording the species. In Kent, the decline between the two surveys of 1971-80 and 1991-2005 is in the order of 50%, which would more than support the English risk rating. The number of sites in the county, however, is such that would not normally qualify as rare or scarce, but clearly its status is such that records are worth monitoring. It is a Kent axiophyte and so is indicative of good (arable) habitat.

Ranscombe. Photo by Lliam Rooney, 9 June 2010

Account

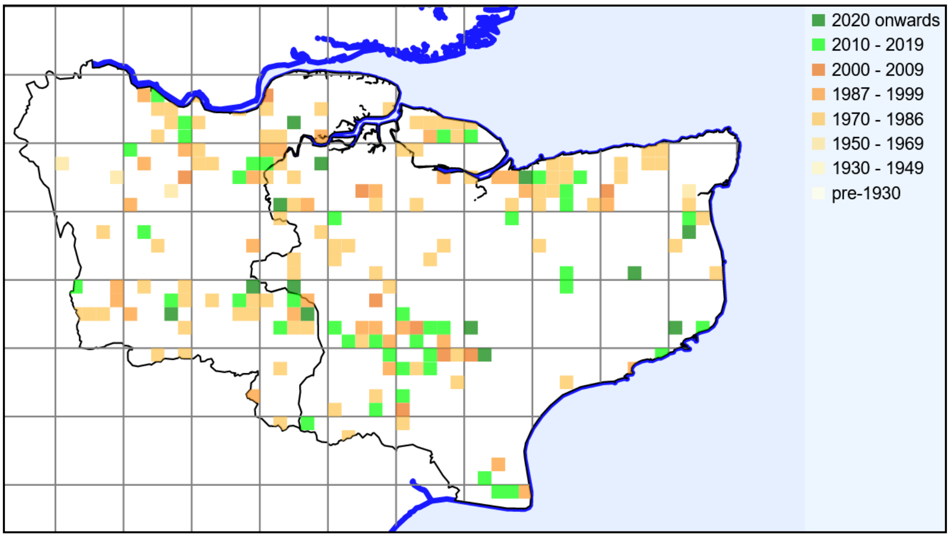
In Kent, the first published record for *Lepidium campestre* was said by Hanbury & Marshall (1899) to be by Thomas Johnson in 1629. However, Francis Rose, in the 1972 edition of Johnson's *Iter Plantarum*, expressed the view that, from Johnson's other writings, *Thlapsi arvense* (Field Penny-cress) seems to have been intended instead. Both taxa were long included under *Thlapsi* (pre- and post- Linnaeus), and both were called Mithridate Mustard, which leaves some scope for confusion. The next earliest potential record traced is that of Thomas Forster in *Flora Tonbrigensis* (1816), who refers to it as 'Among corn, very common', but as his stations were 'Withyham, on the High Rocks, [both in Sussex] and elsewhere', it is ambiguous as to whether 'elsewhere' includes Kent, although this is likely, if very common.

Hanbury & Marshall (1899) regarded Field Pepperwort as so abundant that they gave virtually no specific records, referring to it as common in all the districts, especially on heavy soils, and found in fields and on banks, etc. Records in the first half of the 20th century are not abundant either, in spite of the frequency of the species, although there is in **SLBI** a specimen collected by Ted Lousley in 1933 from near Ranscombe, where it still grows. It was treated in Philp (1982) as rather local – there were clearly gaps in distribution, such as east of Ashford, and it was commonest in north Kent and, albeit scattered, the Weald. It was recorded in 120 tetrads, growing at roadsides, arable fields and waste places. In the 1991-2005 survey (Philp, 2010), however, it was only found in 60 tetrads, looking native (in spite of its archaeophyte status) in open grassland, roadside verges and arable fields.

Bough Beech. Photo by David Steere, 10 June 2014

The 2010-24 records amount to 56 tetrads (63 monads) records, with further decline from the 1995-2005 total, although at a much slower rate. The major decline had already taken place by then and is likely to have been associated with increased agricultural herbicides applied in the 1970s and 80s. Recent records are for arable margins, roadsides, grass tracks, open short cliff-top turf, the edge of a railway formation, grassed-over shingle beach and disturbed ground in a cemetery (with *Kickxia elatine* (Sharp-leaved Fluellen) and *Tripleurospermum inodorum* (Scentless Mayweed) perhaps suggesting an arable origin of the land).

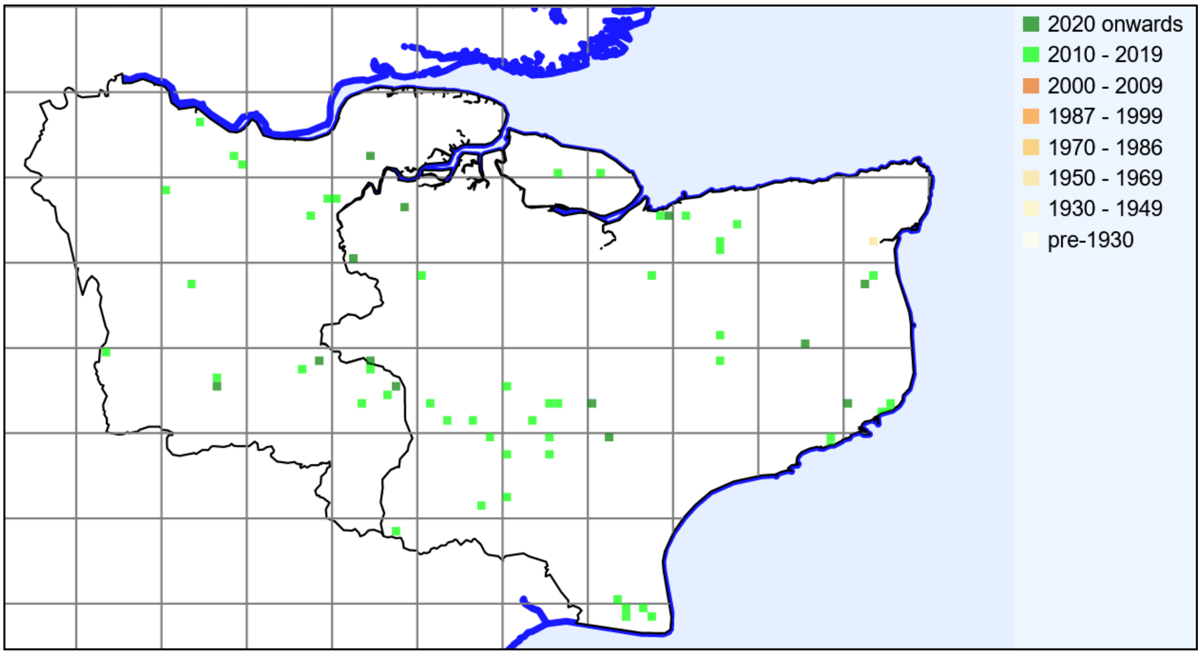
Distribution mapping suggests an affinity with clay soils, primarily Wealden Clay and, in the north, London Clay; for the most part, the lighter soils of chalk and sand are generally avoided, although Dungeness shingle appears to be an exception.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

***Lepidium campestre* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The following map at monad level shows the current position at higher resolution; it lacks older records as monad recording only became the norm in Kent from 2010. It emphsises how much *Lepidium campestre* is now a Low Weald species.

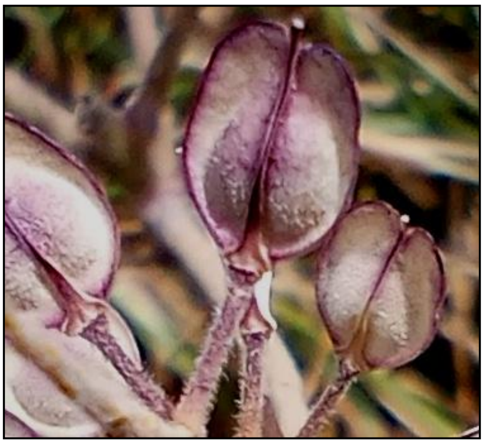
***Lepidium campestre* Kent records to 2024 mapped at monad level, from BSBI database.**

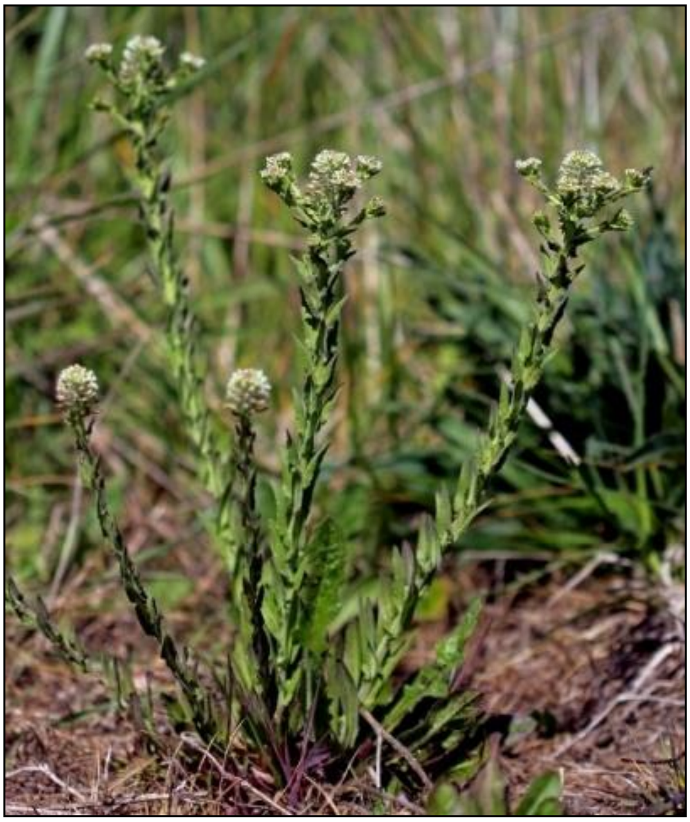

2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Lepidium campestre is an annual, sometimes perhaps biennial, with most seeds germinating in March and April. Some seedlings may continue to emerge until late autumn, and those plants which over-winter are often larger and more robust.

The species differs from *Thlapsi arvense* (Field Penny-cress) in being hairy, having only one seed per valve and bearing swollen, pimple-like cells (vesicles) on the valves. The differences from *Lepidium heterophyllum* (Smith's Pepperwort) are dealt with under the account of that species.

Chattenden, showing veslcles on mature fruits.
Photo by Geoffrey Kitchrner, 17 July 2023-07-19





Dover. Photo by David Steere, 29 April 2017

Lepidium heterophyllum Benth. (Smith's Pepperwort)

vc 15 and 16

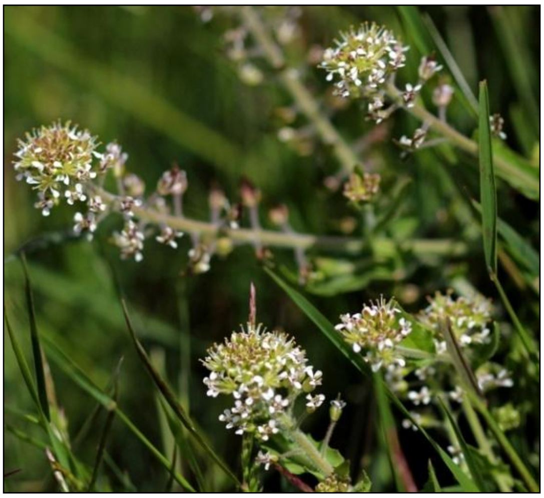
Rarity / scarcity status

Lepidium heterophyllum is widespread in the British Isles, but predominantly in western Britain and in the east and south of Ireland. Its conservation risk status in England and in Great Britain as a whole is one of 'Least Concern'. The position is very different in Kent and some parts of eastern England, where it is absent or very local. On the basis on the data in Philp (2010) the species would be treated as rare in East Kent, but its status is better regarded as **scarce**. It was thought to have gone from West Kent, but a colony was found in 2023 near the Thames north of Dartford.

Account

Lepidium heterophyllum was not, as pointed out by Hanbury & Marshall (1899), separated from *Lepidium campestre* (Field Pepperwort) by the older botanists, so that the first published record which they identified was a listing in H.C. Watson's *Topographical Botany* (given as 1873, although the listing seems not present in that edition, but appears for West Kent in that of 1883). However, they identify a Lydd beach specimen dated 1861 from the herbarium of John Stuart Mill as being this species. Contributors to Hanbury and Marshall's Flora produced a range of records across the county, and the species was assessed as being uncommon (but perhaps more common than reports suggested) on banks and open ground on dry, light soils. Those soils included sand (a sandy field near Sandwich), chalk (a bank near Lenham) and presumably shingle (Lydd beach).

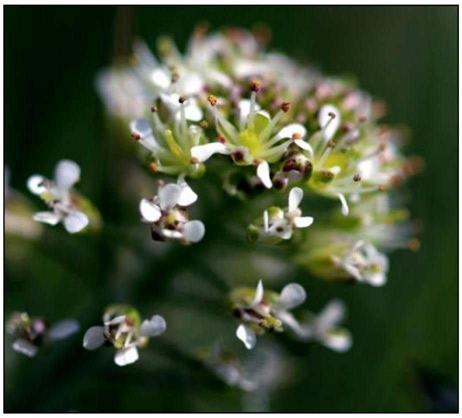
Subsequent West Kent records were thin on the ground. It was regarded as common on Hayes Common in 1903 (W.H. Griffin in the *Woolwich Surveys*, 1909) and subsisted at Hayes at least until 1938, when seen by David McClintock, as also at West Wickham. It was reported by P.H. Cooke near Romney Street in 1933 and by John Palmer near Longfield in 1970. A new site of some 90 plants was discovered by Geoffrey Kitchener in 2023 on a gravelly bank near the Thames bisected by a footpath, north of Dartford.



Dungeness, plant and habitat. Photos by David Steere, 15 June 2016

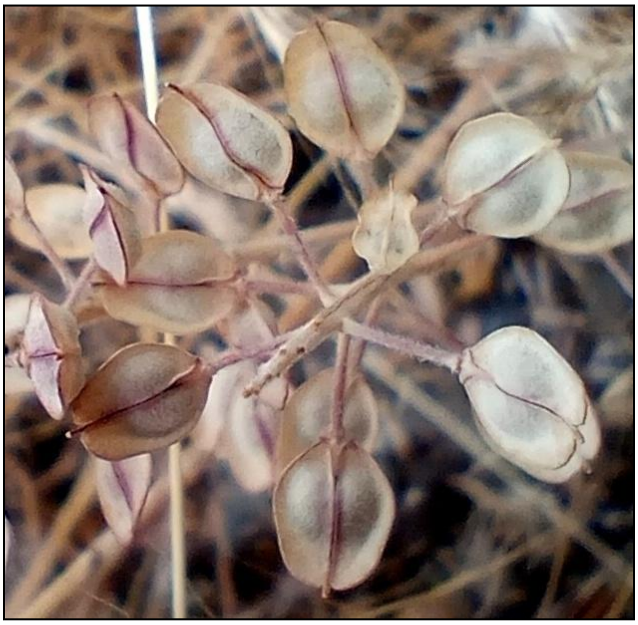
Smith's Pepperwort was found near the Bird Observatory at Dungeness by Francis Rose in 1956, on old shingle workings, and the Dungeness/Lydd area has provided the most consistent records in the county. Indeed, this was the only area where its presence was recorded in Philp (1982), given in three tetrads. In the 1991-2005 survey (Philp, 2010), the species continued to be recorded in just one of these tetrads. However, a further site was found, on fixed sand dunes at Pegwell Bay. East Kent finds in the period 2010-24 have largely been limited to the Dungeness/Lydd area, where presence extends to four tetrads (the same number of monads). Elsewhere, an anomalous colony was found by David Steere in 2024 at Dover on a chalk hillside disturbed by reserve management works

The species is a biennial or more usually perennial, of dry, well-drained, open habitats – sand dunes, shingle, stony and gravelly ground. Because the national distribution is primarily western, this suggests that it is favoured by higher rainfall than is experienced in Kent, even though precipitation drains rapidly through its substrate. Associated species at the Dartford site were generally those capable of withstanding dry infertile conditions: *Anisantha sterilis* (Barren Brome), *Bromus hordeaceus* (Soft-brome), *Catapodium rigidum* (Fern-grass), *Diplotaxis tenuifolia* (Perennial Wall-rocket), *Festuca rubra* (Red Fescue), *Hirschfeldia incana* (Hoary Mustard), *Hypericum perforatum* (Perforate St John's-wort), *Lolium perenne* (Perennial Rye-grass), *Plantago lanceolata* (Ribwort Plantain), *Poa pratensis* (Smooth Meadow-grass), *Veronica arvensis* (Wall Speedwell), *Vulpia myuros* (Rat's-tail Fescue).

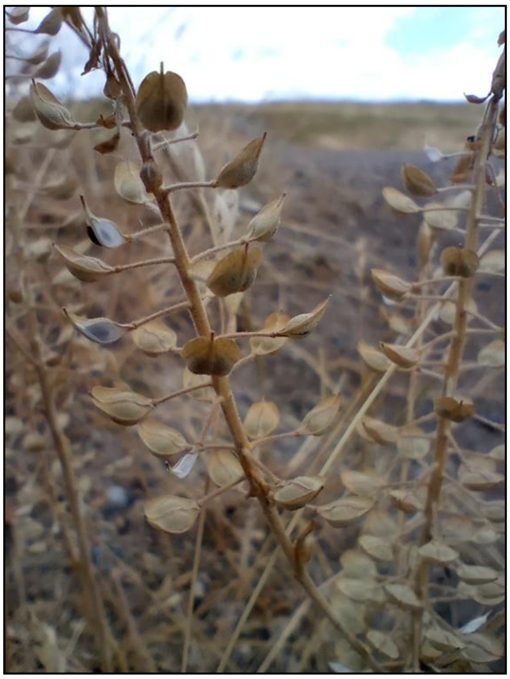


Dungeness. Photo by David Steere, 15 June 2016

Dartford. Photo by Geoffrey Kitchener, 1 July 2023

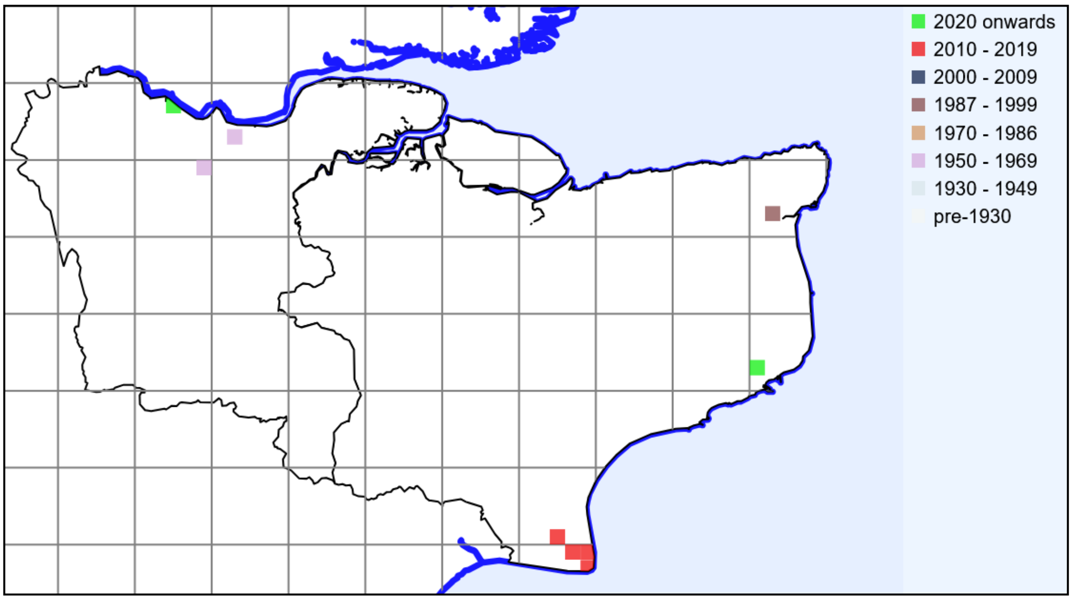


It is not always easy to distinguish from *Lepidium campestre*, especially if fruits are not well developed. The latter is an annual, branched above; *L. heterophyllum* is generally perennial, well rooted, often branching at the base. The style of *L. heterophyllum* usually projects well beyond the notch at the top of the valve; that of *L. campestre* barely projects beyond, if at all. The valves of *L. heterophyllum* may have no swollen, pimple-like cells on the surface (vesicles), or relatively few; those of *L. campestre* are generally well covered with vesicles.



Dartford. Photos by Geoffrey Kitchener, 1 July 2023

***Lepidium heterophyllum* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
East of Dartford Marshes	TQ5577		1 July 2023	GK	TQ 55263 77125, c75m from the Thames, on sandy/gravelly bank cut across by footpath, 60 plants on NW side in area of 2 x 0.7m, 30 on SE side in area of 4 x 0.5m. Associated spp- *Anisantha sterilis, Bromus hordeaceus, Catapodium rigidum, Diplotaxis tenuifolia, Festuca rubra, Hirschfeldia incana, Hypericum perforatum, Lolium perenne, Plantago lanceolata, Poa pratensis, Veronica arvensis, Vulpia myuros*.
Pinden, Longfield	TQ5969		1970	JRP	TQ 598 697, chalk debris by railway.
Lydd south	TR01P		After 1970, before 1981	Philp (1982)	
Dungeness (Boulderwall Farm area)	TR01U		(1) 3 July 2011 (2) After 1970, before 1981	(1) TI (2) Philp (1982)	(1) TR0719. (2) Recorded as TR01U.
Dungeness (lighthouse area)	TR01Y		(1) 15 June 2016 (2) 2010 (3) 27 June 1996 (4) After 1970, before 1981	(1) DS (2) TI (3) EGP (Philp, 2010) (34 Philp (1982)	(1) TR0817, Long Ponds south west. (2) TR0817. (3) & (4) Recorded as TR01Y.
Lydd	TR0521		27 July 2012	OL	
South of Lydd-on-Sea	TR0819		30 May 2012	OL	
Pegwell Bay	TR36G		3 June 1999	EGP & DG (Philp, 2010)	Fixed sand dunes.

Lepidium latifolium L. (Dittander)

vc 15 and16

Rarity / scarcity status

Dittander is considered to be a native plant in coastal locations in Kent and East Anglia, the Severn and the odd spot on the south coast. Elsewhere it has a scattered casual distribution. In England and Great Britain as a whole, its conservation risk is regarded as one of 'Least Concern', although it is a **nationally scarce** plant (i.e. recorded in from 16 to 100 hectads - presumably this is on the basis of its assumed native distribution, as mentioned above, not its overall occurrence). In Kent it is neither rare nor scarce.

Account

The first record of Dittander in Kent appears to be a comment by Thomas Johnson in his *Mercurialis Botanicum* (1634) that 'I found it upon a banke between *Feversham towne* and the Haven'. It is still present on Faversham Creek (2012), although this does not necessarily represent the 1634 site. Christopher Merrett, in his *Pinax rerum naturalium Britannicarum* (1666) claimed that it was 'On most of the Ditches in the *Isle* of *Thanet*'. Thanet is not now notable for its ditches, other than where the ground descends to the Stour and Wantsum where there is still some Dittander, but it is possible that the terrain here was much more brackish and suitable for Dittander when the remains of the Wantsum Channel (which ceased to be navigable as a sea connection in 1672) continued in being.

Seasalter. Photo by Lliam Rooney, 2 August 2010

Hanbury & Marshall (1899) assessed it as a rare and local native, growing on banks near the sea and tidal waters, and they considered it evidently rarer then than it had been formerly. In one or two stations they considered that it might possibly be a relic of cultivation. This dual status was also apparent in the days of Thomas Parkinson who in his *Theatrum Botanicum* (1640) said that the species 'is found naturally growing in many places of this Land, as… upon *Rochester* Common in *Kent*… and in other places, but is usually kept in Gardens'. The early herbals attributed culinary and medical properties to the plant: the former because of the peppery taste of leaves and roots (hence Pepperwort was an alternative name), and the latter, for the supposed beneficial effects on, amongst other things, joint pains or skin marks or scars.

It is a moot point as to whether the former cultivated status of Dittander has had any effect on current distribution. Prompted by suggestions that a Chichester colony might be related to cultivation for the purposes of a mediaeval leper hospital, John Palmer[365] pointed out the inland presence of Dittander in the grounds of three old hospitals in Kent, Bexley Hospital (opened, 1898), Joyce Green Hospital (opened, 1902); and Darenth Hospital (opened, 1902), although none of the sites themselves appeared to have been gardens. The coincidence was heightened by the absence at the time of Dittander from the area; but, given that the species had no place in the British pharmacopeia in the latter half of the nineteenth century, and that there have been a number of casual vc16 records since, this may well be no more than coincidence.

Philp (1982) treated the species as rare, just as had Hanbury & Marshall (1899), and noted presence in 12 tetrads. These included a couple of tetrads in the Whitstable/Swalecliffe area, but most were along the River Stour, with one unexpected appearance of the plant at the edge of the non-tidal Medway in Maidstone. Apart from this, all sightings were on the banks of tidal rivers and near the sea. There were no records for non-metropolitan West Kent. By the time of the 1991-2005 survey (Philp, 2010), the number of tetrad records had increased to 28. It was then treated as a scarce, rather than rare, plant of river banks, sea walls and brackish ditches, and occasionally on roadside verges. This last habitat provides saline conditions through the use of highway de-icing salt. There remained a stable population along the tidal River Stour. Our total of 64 tetrads (93 monads) for 2010-24 confirms a continued increase in Dittander across the county, although the Philp (2010) data did not include all Dittander sites known to botanists at the time.

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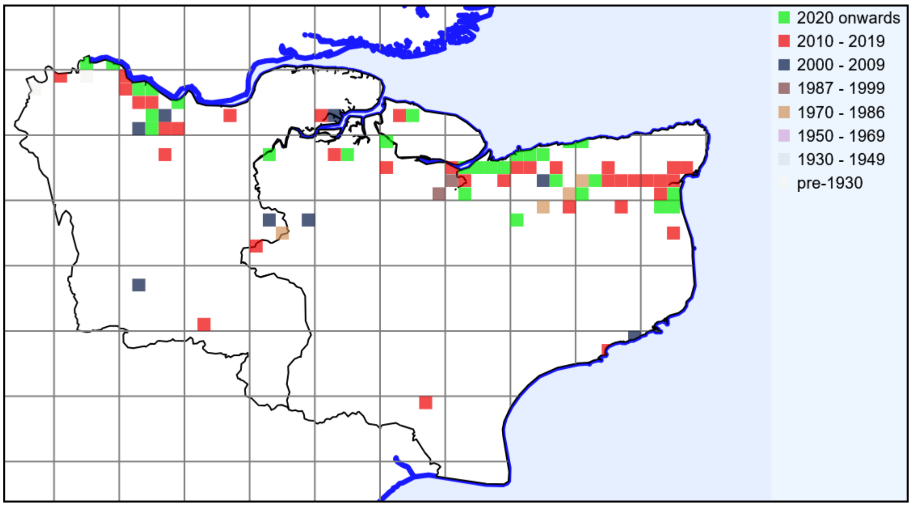
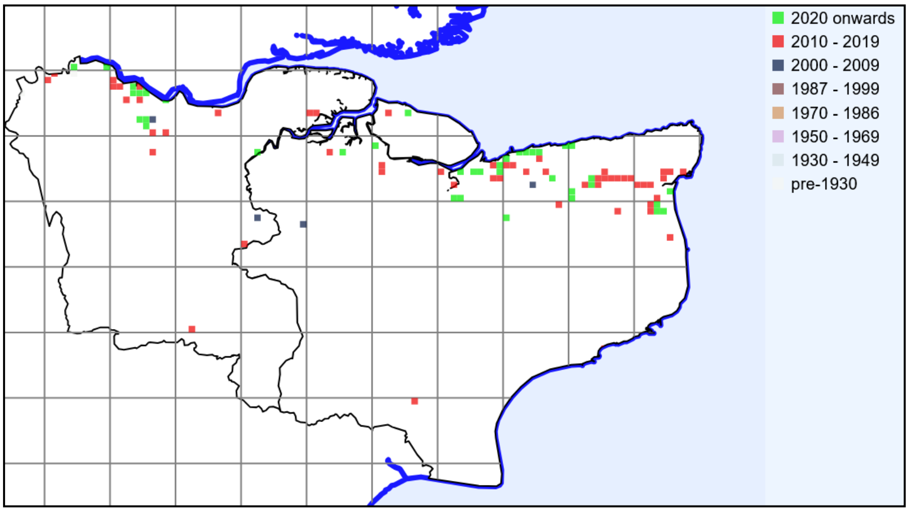
[365] Palmer, J.R. (1994). Dittander near old hospitals. *BSBI News* **66**: 17.



Lepidium latifolium Kent records to 2024 mapped at tetrad level, from BSBI database.

Tetrad level mapping best shows historic losses, and in this case there are few, presumably because of the plant's powers of persistence once roots take hold.



Lepidium latifolium Kent records to 2024 mapped at tetrad level, from BSBI database.

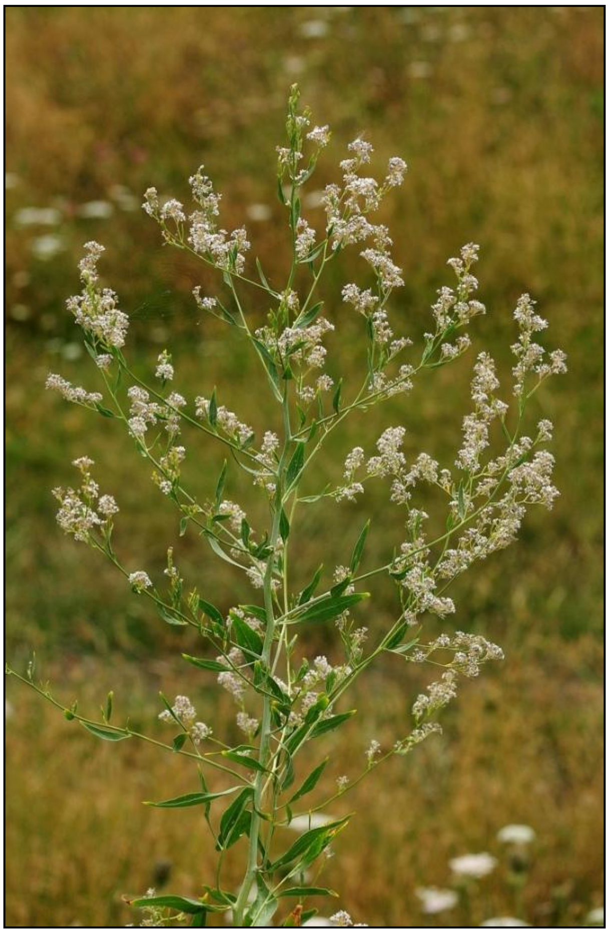
Monad level mapping shows best the fine level of resolution of current local records, as monad level recording was seldom undertaken in the county before 2010. Concentrations are evident along the Stour catchment, the north coast and, nearer London, the Thames estuary and Dartford area.

Near Ash, roadside habitat. Photo by Sue Buckingham, 9 July 2010

Even making allowance that Philp (1982 and 2010) did not include metropolitan West Kent, it is likely that Dittander has never been as common in Kent as now. Some of the increase seems to be the consequence of transporting materials carrying the plant, whose creeping roots are very persistent and can re-generate from small fragments. This can even account for increase which seems to be within the area of natural habitat: in 2014 a large patch was noted by the beach near Beltinge, apparently associated with a deposit of rocks relating to sea defence works. Inland roadside occurrences may be related either to movement of contaminated materials or to transport of seed on tyres. Occurrences include the A2 south east of Faversham (2012), the A2/M25 slip road (2021), the A21 near Pembury (2019), the A299 west of Chestfield (2014), the A257 near Ash (2014) and the B2080 near Appledore (2011).

Lepidium latifolium is a robust and persistent patch-forming perennial, up to 2m high. It can hold its own amongst coarse vegetation, as on river banks; it is salt-tolerant and withstands inundation, but may be found in drier terrain such as gravel or rocky heaps; it can grow in such inhospitable terrain as the cracks in the concrete platform of the old Pegwell Bay hoverport. This competitive ability is related to its extensive root system, potentially more than 3m deep, according to data from North America (where it is an invasive alien). Apparently, root fragments are buoyant and seeds, after a period of immersion, likewise; so that this would assist its spread along river or ditch systems.

It is very distinct from other species of *Lepidium,* and should present no difficulties of identification.



Seasalter. Photo by Lliam Rooney, 2 August 2010

Leymus arenarius (L.) Hochst. (Lyme-grass)

vc 15

Rarity / scarcity status

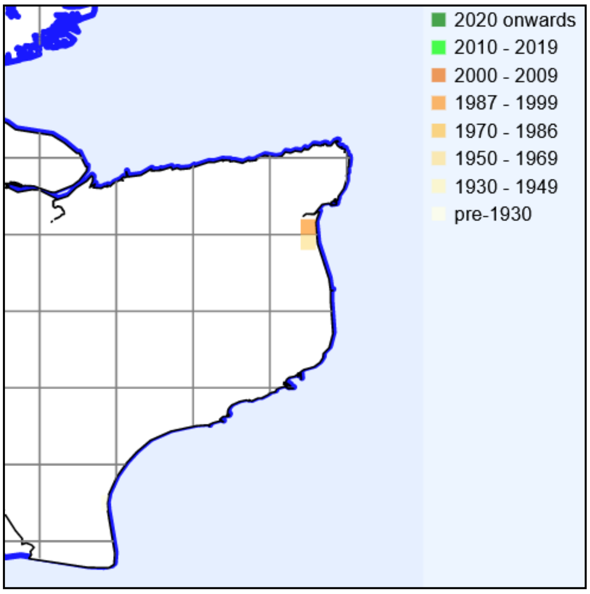
Lyme-grass is frequent on coastal sand around the costs of the British Isles, except for south and west Ireland and the English south coast. Populations generally seem stable and the conservation risk status of the species in England and in Great Britain as a whole is one of ‘Least Concern’. In Kent, however, it has only one recent station, if this still subsists, which is questionable, and it must at least be considered very **rare**.

Account

Hanbury & Marshall (1899) were of the view that earlier Kent records of this species were in error. They dismissed a claim by Dr R.E. Hunter (whose observations were prone to error) at Margate, but were more respectful of a record (‘Foot of the cliffs, Dover, sparingly’) by Dr Eyre de Crespingy (died 1895), who was a competent botanist. The verdict here was ‘There is no particular reason against the existence in Kent of this well-marked and handsome grass… but it must at present be excluded, pending further evidence’. There is, however, a BSBI database record from the Littlestone area, made by Lady Davy in June 1904 and her identification abilities are not in doubt (she was a first finder, and identifier, of *Carex microglochin* in the British Isles).

Hanbury and Marshall also commented on a taxon then called *Elymus geniculatus* Curtis which had a possible claim to be a variant of *Leymus arenarius,* but which at best would appear to have been a diseased or depauperate state[366]. This was supposed to have been found in a saltmarsh near Gravesend, but had gone by the 1850s.

The first modern confirmed discovery appears to have been that of Francis Rose and C.A Lester, in October 1962. A specimen is held at **MNE**, marked as from the foredunes at the foreshore of Prince’s Links, Sandwich Bay. In June next year, a further collection was made, now at the National Museum of Wales, by R.A. Boniface, who described it as on the blown sand and stabilised dunes of Sandwich Sands, with several clumps towards Shell Ness. *Leymus arenarius* has continued in this locality, said in Philp (1982), to be increasing steadily on the upper shore of Sandwich Bay (TR36K). A survey in March 1983 by Andrew Henderson produced some fuller grid references: TR 351 620 for Shell Ness (this would appear to be outside Eric Philp’s TQ36K); TR 354 605 for sand dunes between Prince’s Golf Club and the sea; and a further grid reference not readily interpretable for sand dunes on the coast near Royal St George’s. In Philp (2010), Lyme-grass is given as still persisting at Sandwich, but with the comment that its original arrival may have derived from deliberate planting. Evidence is not known for this, although the species is planted for dune stabilisation. Further north, on some low sand dunes at Pegwell Bay, TR3264, it was also seen growing by Joyce Pitt on 5 July 2009.



***Leymus arenarius* Kent records to 2024 mapped at tetrad level, from BSBI database.**

It is a robust perennial occurring on coastal sand, especially loose sand, with which its root system copes well. It has deep vertical roots terminating in leafy shoots, which eventually become flowering; and also creeping horizontal roots, patch-forming and sand-binding. It is thought that spread from rhizome fragments is more frequent than from seed. It is frequently associated with *Ammophila arenaria* (Marram), although its Kent associates appear not to have been recorded. The bluish colour of the plant is very distinctive.

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[366] T.E.T. Bond (1952). *Elymus arenarius* L. Biological Flora of the British Isles. *Journal of Ecology* **40**: 217-227.

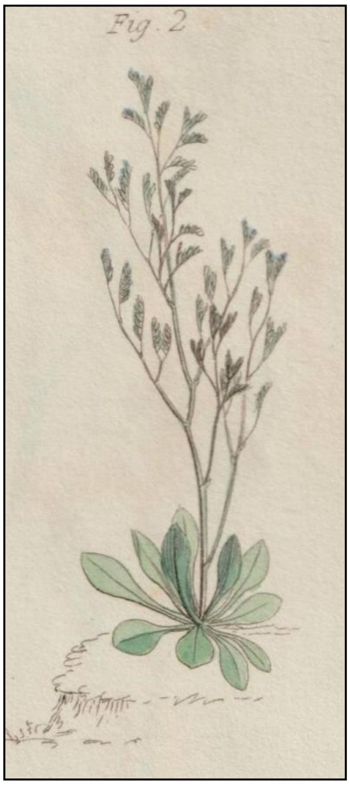
Somewhat surprisingly, we have no recent (post-2010) records for this taxon, but searches at Sandwich / Shell Ness have been unsuccessful and it may have gone from there. At some stage, it may be necessary to take a view as regards moving the species to the county 'probably extinct' list.

Limonium binervosum (G.E. Sm.) C.E. Salmon (Rock Sea-lavender)

vc 15

Rarity / scarcity status

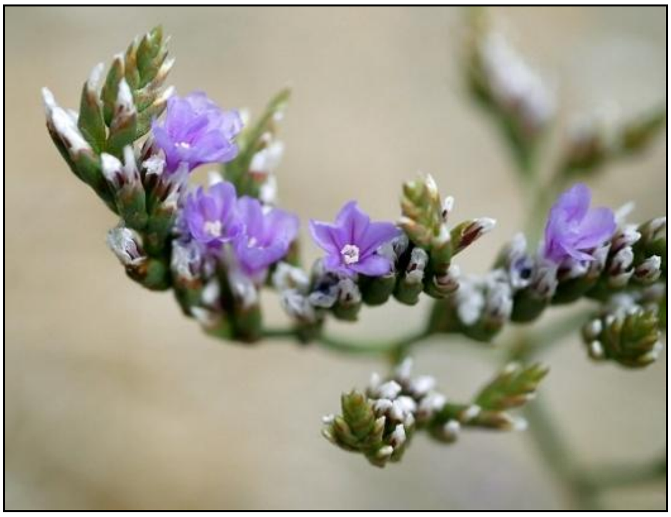
Limonium binervosum is a salt-tolerant perennial which grows on coastal cliffs and rocks, also saltmarshes, around the shores of the British Isles. As it is apomictic, its isolated colonies through uniparental reproduction preserve minute differences from other populations which have resulted in them being named as different species and subspecies. *Limonium binervosum* agg. is a name applied to nine species, of which one is *Limonium binervosum* in the strict sense and this is the one with which we are concerned in Kent. As a result of local differences, however, *Limonium binervosum* in the strict sense may be regarded in Kent, following Ingrouille & Stace (1986)[367], as divided into subspecies, of which subspecies *binervosum* is a plant of Sussex as well, and subspecies *cantianum* is endemic to Kent. (The position is actually more complicated than this, and is described further below.) Both of these subspecies are **nationally rare**; *Limonium binervosum* as a species in the strict sense is **nationally scarce**. In Kent, the species is neither rare nor scarce; we do not have sufficient data for the subspecies to ascertain their local rarity/scarcity status. It is a Kent axiophyte, and so is indicative of good habitat.



From G.E. Smith's *Catalogue* (1829)[368]

Account

The first Kent record is given by John Gerard in his *Herball* (1597) as *Limonium parvum*: 'I could never finde in any other place but upon the chalkie cliffe going from the towne of Margate downe to the sea side, upon the left hand'. This was presumably a small and impermanent colony, given that Thomas Johnson and his fellow apothecaries explored these cliffs and foreshore in 1632 without recording it, nor have there been subsequent records here, the main Kentish distribution of Rock Sea-lavender being along the east coast cliffs from North Foreland in the north to Folkestone in the south.



Folkestone. Photo by David Steere, 19 June 2020

Its Kentish occurrence was studied by G.E. Smith, who published the results in *A Catalogue of Rare or Remarkable Phaenogamous Plants, collected in South Kent* (1829) on the assumption that the plant could be equated with *Statice cordata*. This identification he withdrew shortly afterwards, naming part of the range of the Kent plants which he had seen as a new species[369], *Statice binervosa* (the name *binervosa*, as he mentioned in his manuscript notes in his own copy of the *Catalogue*, being taken from the 'nervure of the leaves, these being a network of veins independent of the longitudinal nervet'). The specific epithet *binervosa*/*um* later followed the transfer of sea-lavenders from *Statice* into *Limonium*. His finds were upon the side, and beneath, upon the ruins of chalk cliffs, Eastwear By, Dover, Ramsgate and upon a turfy spot adjoining the shore at Lydden Spout.

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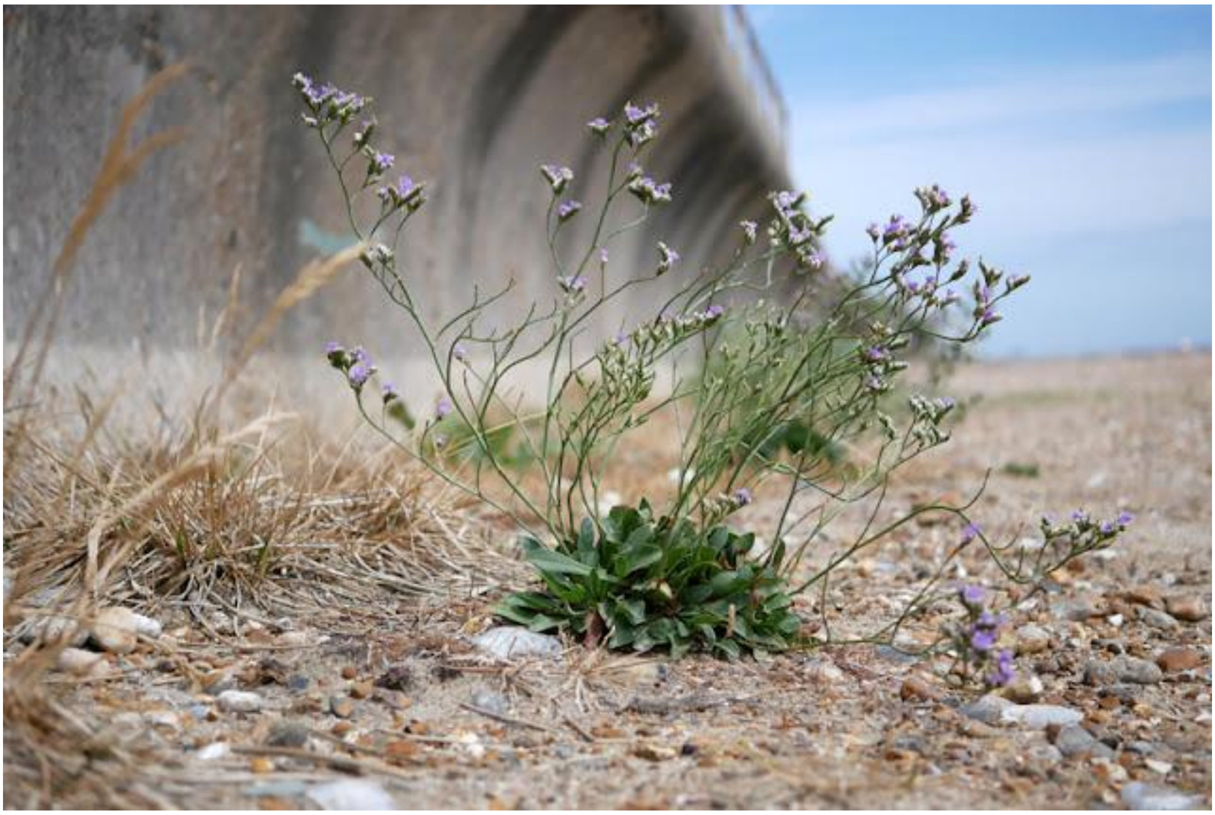
[367] Ingrouille, M.J. & Stace, C.A. (1986). The *Limonium binervosum* aggregate (Plumbaginaceae) in the British Isles. *Botanical Journal of the Linnean Society* **92**: 177-217

[368] This illustration was selected as iconotype *for Limonium binervosum* (G.E. Smith) C.E. Salmon by Ingrouille & Stace (1986). P.D. Sell treats it as *Limonium calcicola* P.D. Sell.

[369] Smith, G.E. (1831). 2663 STATICE binervosa *Dwarf Sea-Lavender*. In Hooker, W.J., *Supplement to the English Botany of the late Sir J.E. Smith and Mr. Sowerby*, London.

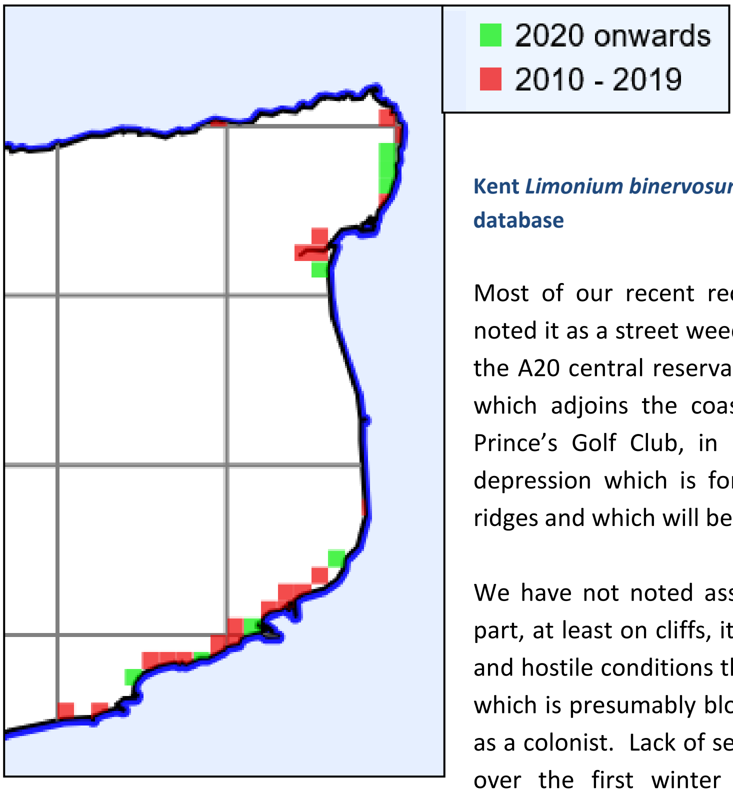
Hanbury & Marshall (1899) assessed the species (as *Statice auriculaefolia*) as a local native of cliffs and saltmarshes, stating that it could be fairly called common from Walmer to Folkestone. Sightings outside this range included Sandgate to the south, Ramsgate to the north (this was reported as far back as the 1724, the third edition of Ray's *Synopsis*), and on Sheppey (Sheerness and Harty Isle).

The Sheppey records were doubtless saltmarsh, and the nature of this habitat, which he saw in 1959 at Shellness, was described by Francis Rose in his manuscript *Flora of Kent*. 'It occurs here on sandy shingle behind the *Ammophila*-dominated beach adjacent to saltmarsh, on ground which is never immersed in saltwater but is moistened from below by salt water at the highest spring tides'. (He also saw this Sea-lavender another location called Shellness, this one being north east of Sandwich, where it was present in 1946 and 1954, in the uppermost zone of the sandy saltmarsh.) Additionally on Sheppey, at Harty in 1946, he confirmed a historic record by finding a few plants on a sandy patch on the sandy saltmarsh. Apart from records from both Shellnesses in Philp (1982), confirmed for the Sandwich Shellness in 2011, saltmarsh sightings in Kent have ceased, but this may be oversight. *Limonium binervosum* clearly has a preference for firm sandy/shingly ground in such situations, and the Shellness sites have shell-sand, but the relationship with saltmarshes is such that it might be overlooked for *Limonium vulgare* (Common Sea-lavender), a frequent saltmarsh plant with much larger, fleshier leaves bearing pinnate veins.



Folkestone. Photo by David Steere, 19 June 2020

However, the norm for Kent is clearly growth on or below the ledges of sea cliffs, generally chalk, albeit with potential to spread to sand/shingle below, and Francis Rose noted in the 1950s that it was abundant on the ledges of the chalk cliffs within the salt spray zone (about 200 feet up the cliffs) along the whole of the coast between East Wear Bay (Folkestone) and Kingsdown. This section of coast, together with the chalk cliffs of eastern Thanet, supplied most of the17 tetrads for the period 1971-80 given in Philp (1982). It also supplied all the 19 tetrad records for the period 1991-2005 given in Philp (2010), so there are no losses here. The same coastline (with a single plant outlier near Birchington) has supplied 21 tetrad records (30 monads) in our 2010-24 sightings. Those recent records, mapped at monad level below, constitute our current register data.



Kent *Limonium binervosum* monad records 2010 to 2024, from BSBI database

Most of our recent records are from chalk cliffs, but we have noted it as a street weed in many coastal parts of Dover, including the A20 central reservation, and on the walls of Sandgate Castle, which adjoins the coastal promenade. At Sandwich Bay near Prince's Golf Club, in 2020 it was seen at the end of a long depression which is forming on the beach between sand dune ridges and which will become a new brackish lagoon.

We have not noted associated flora generally, but for the most part, at least on cliffs, it grows in such exposed, nutrient-deficient and hostile conditions that little else will grow. It spreads by seed which is presumably blown into cracks and crevices, where it acts as a colonist. Lack of seed dormancy requires that seedlings grow over the first winter and achieve sufficient root growth by summer to withstand drought conditions[370].

The degree of local variation within *Limonium binervosum* has encouraged naming to reflect this, although it is difficult to apply these names and several plants from a population should be examined for identification purposes. The standard division, by Ingrouille & Stace (1986) (cited above), has been, so far as concerns Kent, to divide into two subspecies, subsp. *binervosum* and subsp. *cantianum*. Sell & Murrell (2018)[371], however, have raised these to the level of species, and have added three more species, *L. calcicola* (Chalk Sea-lavender), *L. sanctamargaritense* (St Margaret's Bay Sea-lavender) and *L. altum* (Tall Sea-lavender). It is not possible to match up the two treatments fully, but it is possible that the first two of these might fall under subsp. *binervosum* (together with *L. binervosum* as used by Sell & Murrell) and *L. altum* might fall under subsp. *cantianum* (together with *L. cantianum* as used by Sell & Murrell).

For the purpose of recording for this rare plant register, we are taking *L. binervosum* as the usual name to record, with encouragement to identify to subspecific level if practicable. The differences are:

- leaves usually less than 10mm wide and 2.5mm thick with acute tip, subsp. ***binervosum***;
- leaves usually more than 10mm wide and 2.5-3.5mm thick with acute or rounded tip, subsp. ***cantianum***.

Records for the two subspecies are given below. As regards subspecies *binervosum*, there are records by Eric Philp on the BSBI database for the following tetrads (TR23C, TR23H, TR23N, TR23P, TR23U, TR23Z, TR33E, TR34A, TR34F, TR34G, TR34L, TR34S, TR34Y) which are attributed to *L. binervosum* subsp. *binervosum*, 1991-99, but his recording cards do not specify the subspecific level, so he may not have intended this. This is especially as Philp (2010) does not map to subspecies, on the basis that Eric Philp considered that the subspecies graded into each other.

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[370] Ingrouille, M. (1982). The colony structure and taxonomic characterisation of apomictic *Limonium* (Plumbaginaceae) in the British Isles. PhD thesis, University of Leicester.

[371] Sell, P. & Murrell, G. (2018). *Flora of Great Britain and Ireland,* vol. 1. Cambridge University Press, Cambridge.

Site	Grid reference	Site status	Record date	Recorder or source	Comments
Limonium. binervosum* subsp. *cantianum					
St. Margaret's at Cliffe	TR3644		(1) 1979 (2) 1873, 1875	(1) MJI (2) Various collectors	(1) TR 368 443. Given in Ingrouille & Stace, 1986. (2) Specimens in Manchester Museum.
North Broadstairs	TR 399 687		July 1979	MJI	Given in Ingrouille & Stace, 1986.
South Broadstairs	TR36Y		(1) 17 June 2019 (2) 21 April 2004 (3) July 1979	(1) GK (2) EGP & BW (3) MJI	(1) TR3966, common on chalk cliffs. (2) TR36Y. (3) TR 398 671. Given in Ingrouille & Stace, 1986.
Dumpton Gap, Ramsgate	TR 349 622		July 1979	MJI	Given in Ingrouille & Stace, 1986.
Oldstairs Bay	TR 381 473		July 1979	MJI	Given in Ingrouille & Stace, 1986.
Sandwich Bay	TR36K		1991-98	EGP	
Shellness, Sandwich/Pegwell Bay	TR36L		(1) 1991-98 (2) July 1979	(1) EGP (2) MJI	(1) TR36L, [assumed to be Shellness]. (2) TR 349 622. Given in Ingrouille & Stace, 1986.
Limonium binervosum* subsp. *binervosum					
Dover	TR 307 398		July 1979	MJI	Given in Ingrouille & Stace, 1986.
Folkestone Warren	TR 260 383		July 1979	MJI	Given in Ingrouille & Stace, 1986.

However, in parallel with considering *L. binervosum* as split into these two subspecies, records are taken for Sell & Murrell's treatment as multiple species. This treatment keys out as follows.

1	stems up to 18cm; leaves 5-20 x 2-7mm	***L. binervosum*** [This is quite a narrow view of what the name covers]
1.	stems (10)20-40cm; leaves 15-40 x 5-20mm	**2.**
2.	stems 10-25(35)cm; leaves 15-25 x 5-15mm	***L. calcicola***
2.	stems 20-40cm; leaves (15)20-40 x 8-20mm	**3.**
3.	inflorescence branches all sweeping to one side	***L. sanctamargaritense***
3.	inflorescence branches arranged on both sides of stem	**4.**
4.	stems 20-40cm; petiole 25-50mm	***L. altum***
4.	stems 20-30cm; petiole 15-25mm	***L. cantianum***

Some characters for these species are given here:

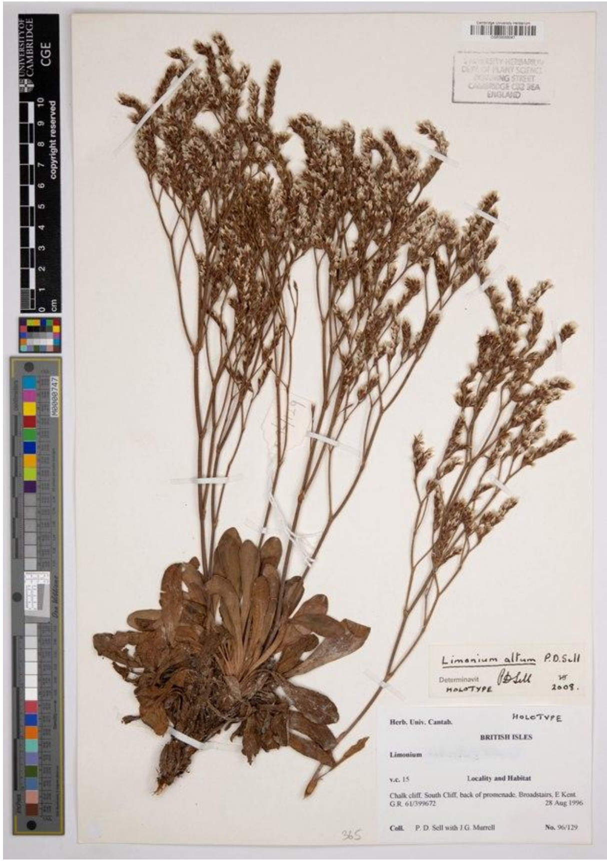
Character		*altum*	*binervosum*	*calcicola*	*cantianum*	*sanctamargaritense*
height		20-40cm	Up to 18cm	10-35cm	20-30cm	30-40cm
branching		For most of stem, at 30-35°	For most of stem, with short sterile branches below at 20-25°	For 2/3 stem, at 40-50°	For most of stem, at 30-35°	Sterile branches reaching low down; all branches turning to one side, at close angle to stem
Leaf width		8-18mm	2-7mm	5-15mm	10-20mm	8-15mm
Leaf length		20-40mm	5-20mm	15-25mm	22-40mm	20-40mm

Petiole length		25-50mm, broadly winged	‘fairly long’	10-20mm, rather narrowly winged	15-20(25)mm, broadly winged	20-50mm, broadly winged
Stem diameter		1.7-2.0mm	Up to 1.0mm	Up to 1.5mm	1.7-2.0mm	1.8-2.0mm
Spikes		15-35mm	10-20mm	12-35mm	15-30mm	18-25mm

Each of the Sell & Murrell taxa is given a separate account below, to assist fuller understanding and to encourage recording by botanists who wish to adopt this naming.

Limonium altum (G.E. Sm.) P.D. Sell (Tall Sea-lavender)

Tall Sea-lavender is an endemic and a very rare species, currently known only from South Cliff, at the back of the Broadstairs promenade, where it seems to be the only species of Sea-lavender, plus a small colony on the North Cliff, where it grows with *Limonium cantianum* (Kent Sea-lavender), a species with a height range which does not extend so tall and with shorter petioles. It was first noted in 1996 and named in 2008, although the name was not published until 2018.


UNIVERSITY OF CAMBRIDGE
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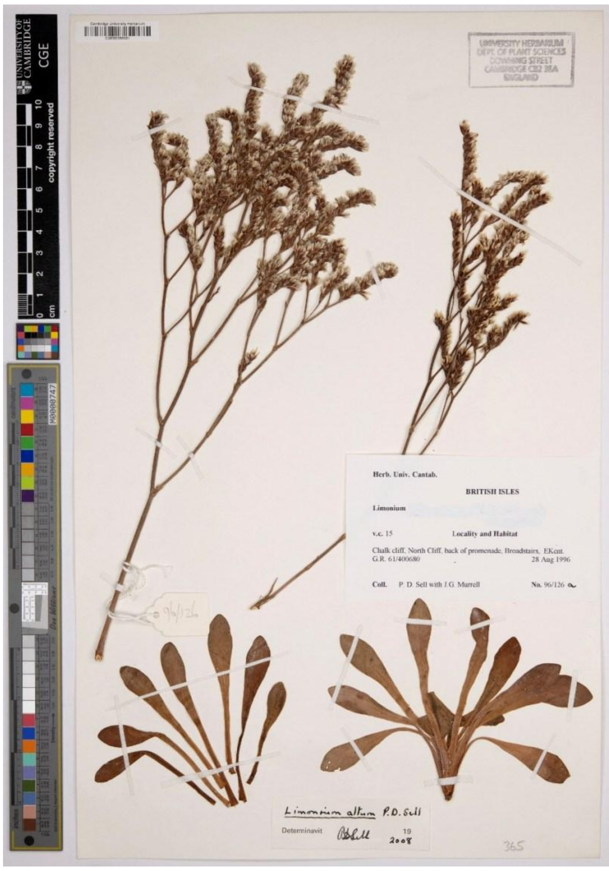
copyright reserved
Limonium altum P.D.Sell
Determinavit P.D.Sell 15 2008.
HOLOTYPE
Herb. Univ. Cantab.
HOLOTYPE
BRITISH ISLES
Limonium
v.c. 15
Locality and Habitat
Chalk cliff. South Cliff, back of promenade, Broadstairs, E Kent
G.R. 61/399672
28 Aug 1996
Coll. P. D. Sell with J.G. Murrell
No. 96/129
365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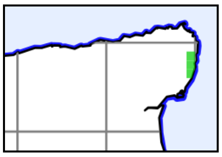
Herb. Univ. Cantab.
BRITISH ISLES
Limonium
v.c. 15
Locality and Habitat
Chalk cliff, North Cliff, back of promenade, Broadstairs, EKent.
G.R. 61/400680
28 Aug 1996
Coll. P. D. Sell with J.G. Murrell
No. 96/126 a
Limonium altum P.D. Sell
Determinavit P.D.Sell 19 2008
365

Cambridge University Herbarium

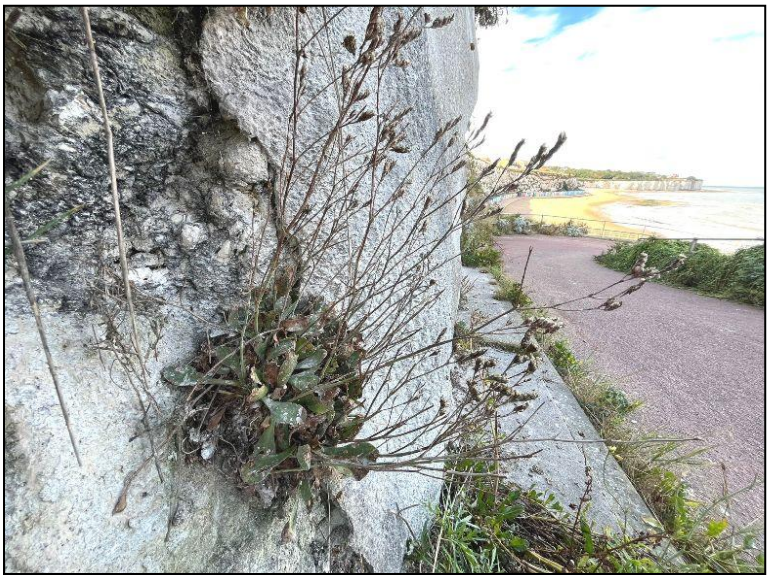
South Cliff, specimen CGE00055047 **North Cliff, specimen CGE00055021**

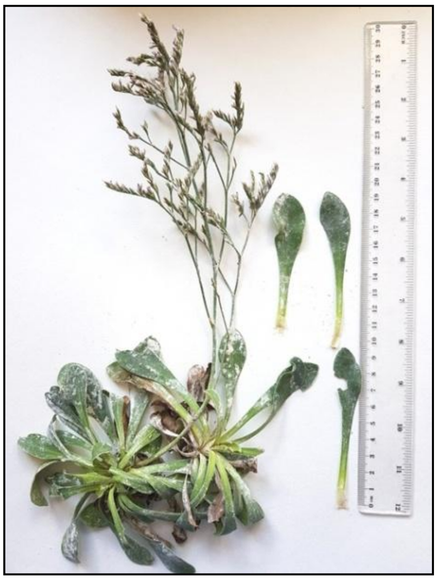
It is a tall plant, with numerous flowering stems arising from a basal rosette whose leaves and their petioles are fairly long. The height range, however, can overlap with that of other microspecies and petiole length appears to be a better guide for identification. *L. binervosum* and *L. calcicola* are generally smaller plants with shorter leaves; *L. sanctamargaritense* differs in its sideways-swept branches; and *L. cantianum* has much shorter petioles (but it is not always easy to decide where the petiole ends and the leaf begins).



Characters for *L. altum*	**Sell & Murrell description**	**2024 record TR 39944 68141**	**2024 record TR 39727 66769**
Flowering stem height	20-40cm	To 45cm	28cm
Branching	For most of stem, at 30-35°	Branching for most of the stem 25-34° with many flowering stems closely packed	Branching more or less from bottom, narrow, 20°
Leaf width	8-18mm	10-15mm	16-22mm
Leaf length	20-40mm	20-39mm	30-40mm
Petiole length	25-50mm, broadly winged	25-45mm	35-50mm
Stem diameter	1.7-2.0mm	1.5-2.0mm	2.0mm
Spikes	15-35mm	20-38mm	15-33mm

Site	Grid reference	Site status	Record date	Recorder or source	Comments
Limonium altum					
East Cliff, Broadstairs	TR3968	SSSI	12 September 2024	KBRG meeting	TR 39944 68141 at the base of a chalk cliff where it meets a snaking walkway up from the beach. Several plants all tall, up to 45 cm, and with multiple flowering stems bunched tightly together. All having very long petioles. Taken to be *L. altum*.
Below Western Esplanade, near Dumpton, Broadstairs	TR3966	SSSI	(1) 12 September 2024 (2) 13 August 2024	(1) KBRG meeting (2) PAH & ACL	(1) TR 39727 66769, 3 or 4 plants in a loose clump at the base of the chalk cliff where it meets a concrete platform at the back of the prominade. Medium sized plants with very long petioles. Taken to be *L. altum*. (2) TR 3972 6675, base of wall on undercliff path below Western Esplanade, Broadstairs.
South Cliff, back of promenade, Broadstairs	TR 399 672	SSSI	28 August 1996	PDS & JGM, specimens CGE00055018, CGE00055019, CGE00055022, CGE00055023, CGE00055047.	Grid reference is a little inaccurate, being out to sea.
North Cliff, back of promenade, Broadstairs	TR 400 680	SSSI	28 August 1996	PDS & JGM, specimen CGE00055021	A small colony, with *L. cantianum*.



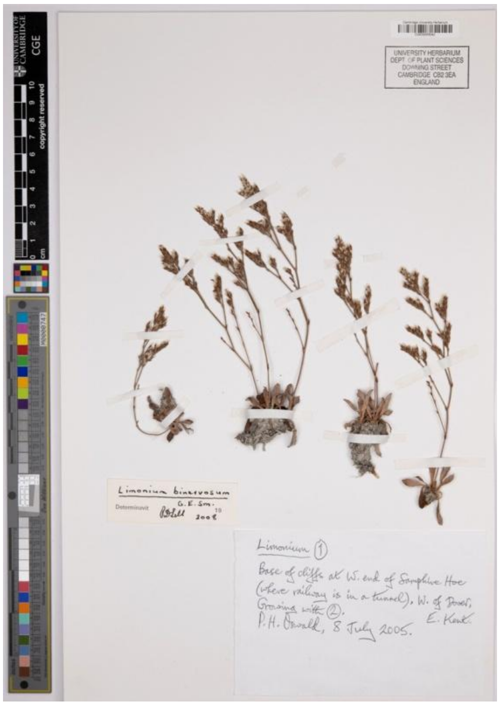


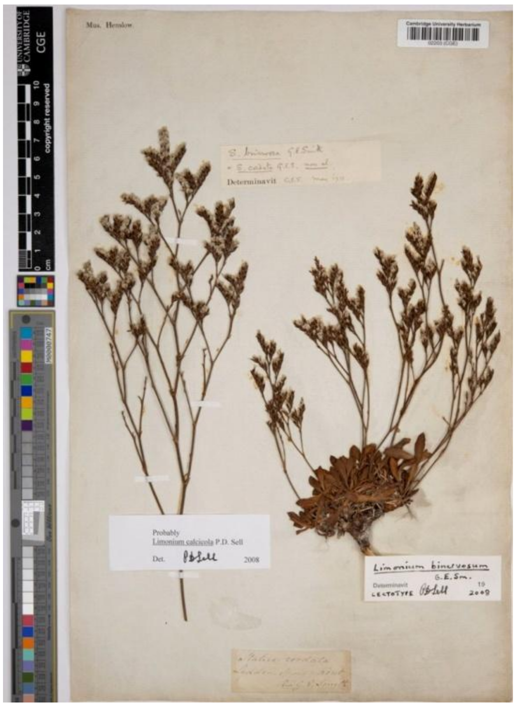
East Cliff, photo by Owen Leyshon, 12 September 2024

Specimen from near Dumpton, photo by Sue Buckingham, 12 Sepember 2024

Limonium binervosum (G.E. Sm.) C.E. Salmon (Rock Sea-lavender) [sensu P.D. Sell]

Rock Sea-lavender, with its relatively widespread distribution, has already been described above. This account deals with it according to its treatment in Sell &Murrell (2018). That is, so as to distinguish it from the other species given here (*L. altum*, *L. calcicola*, *L. cantianum* and *L. sanctamargaritense*), which might otherwise be regarded as just part of *L. binervosum* in the broader sense. As used by Sell & Murrell, the name applies to plants of Kent and East Sussex.


Limonium binervosum
G.E. Sm.
Determinavit
19
2008
Limonium ①
Base of cliffs at W. end of Samphire Hoe (where railway is in a tunnel), W. of Dover, Growing with ②.
E. Kent
P.H. Oswald, 8 July 2005.


Probably
Limonium calcicola P.D. Sell
Det.
2008
Limonium binervosum
G.E. Sm.
Determinavit
LECTOTYPE
19
2008

Cambridge University Herbarium

Samphire Hoe, specimen CGE000550042

Lydden Spout (left probably *L. calcicola*, right *L. binervosum*) specimen CGE000550041 (collector, G.E. Smith)

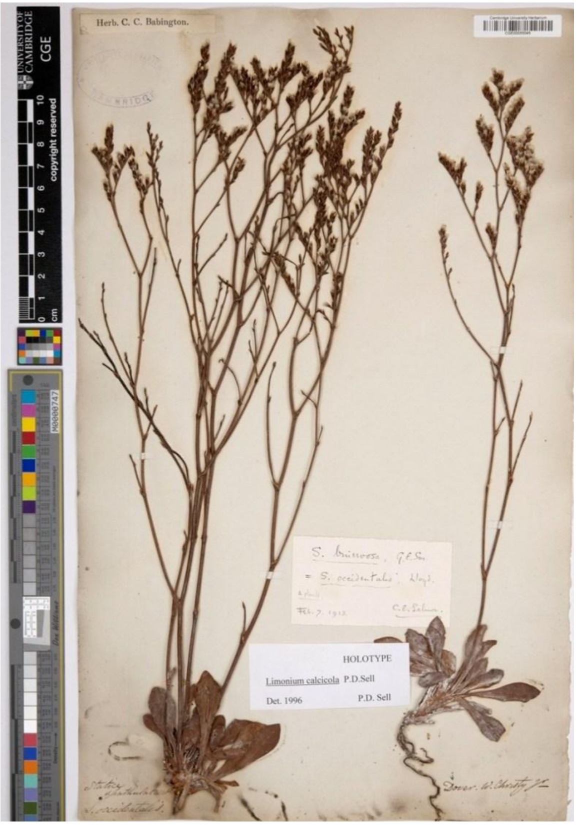
It is a small plant, both in overall height (not exceeding 18cm) and in its parts (see table of characters above, under the main *L. binervosum* account, e.g. as to leaf dimensions and flowering stem diameter). It should accordingly be well distinguishable from the other species (*L. altum*, *L. calcicola, L. cantiana* and *L. sanctamargaritense*).

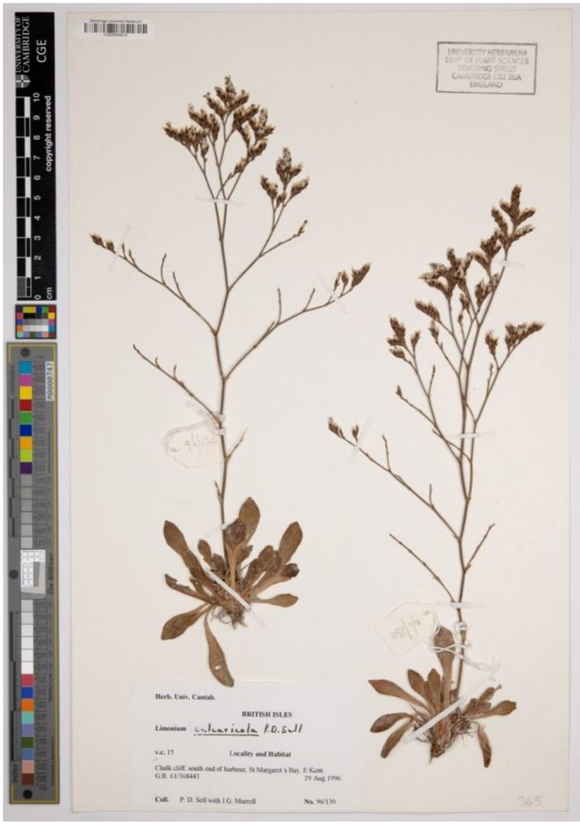
The following table only gives determinations by P.D. Sell.

Site	**Grid reference**	**Site status**	**Record date**	**Recorder or source**	**Comments**
Limonium binervosum					
Lydden Spout	TR2838 [inferred]	SSSI	Before 1829	G.E. Smith, specimen CGE000550041	As *Statice cordata*, re-determined as *L. binervosum* by PDS, 2008 and selected s lectotype.
Samphire Hoe	TR23Z [inferred]	SSSI	8 July 2005	PHO, specimens CGE00055043, CGE00055042	(a) Growing on Channel Tunnel spoil at Samphire Hoe, and (b) at west end of Samphire Hoe (where railway is in tunnel, both determined by PDS as *L. binervosum,* 2008. [*L. calcicola* also present at (b).]
'Cliffs near Deal' [Oldstairs Bay?]	TR34 [inferred]		1885	HTM, specimen CGE00055044	Cliffs near Deal, as *Statice occidentalis*, four plants on one sheet, determined as part *L. calcaricola*, part *L. binervosum* by PDS, 1996.

Limonium calcicola P.D. Sell (Chalk Sea-lavender)

Chalk Sea-lavender is an endemic and is a species with a limited range, growing on chalk cliffs and rubble from Sussex along the south Kent coast to St Margaret's Bay. There is a complication as regards its naming in that *Limonium calcicola* was published posthumously in Sell & Murrell (2018), with Peter Sell having approved substantial parts of the edited prepublication version of the relevant volume before he died, and that text refers to a holotype which is labelled *Limonium calcicola*. However, there are numerous other herbarium specimens at **CGE** where he instead used the term *Limonium calcaricola* which was not published. The earliest record is a collection by Professor J.S. Henslow at Dover in 1827, since determined as this species.


Herb. C. C. Babington.
HOLOTYPE
Limonium calcicola P.D.Sell
Det. 1996
P.D. Sell


Herb. Univ. Cantab.
BRITISH ISLES
Limonium calcaricola P.D. Sell
Locality and Habitat
Coll. P.D. Sell with J.G. Murrell

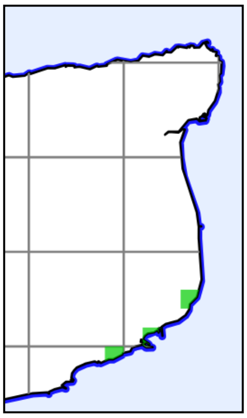
Cambridge University Herbarium

Dover, specimen CGE00055045

St Margaret's Bay, specimen CGE00055012

It is a medium-sized plant (but can be shorter than the other Kent species except for *L. binervosum*) with thin stems (not exceeding 1.5mm diameter and so thinner than those of *L. altum*, *L. cantiana* and *L. sanctamargaritense*). Leaf length tends to be shorter than other Kent species other than *L. binervosum*. Peter Sell considered the illustration of *L. binervosum* subsp. *binervosu*m in Ingrouille & Stace (1986) (cited earlier) to be of this species.

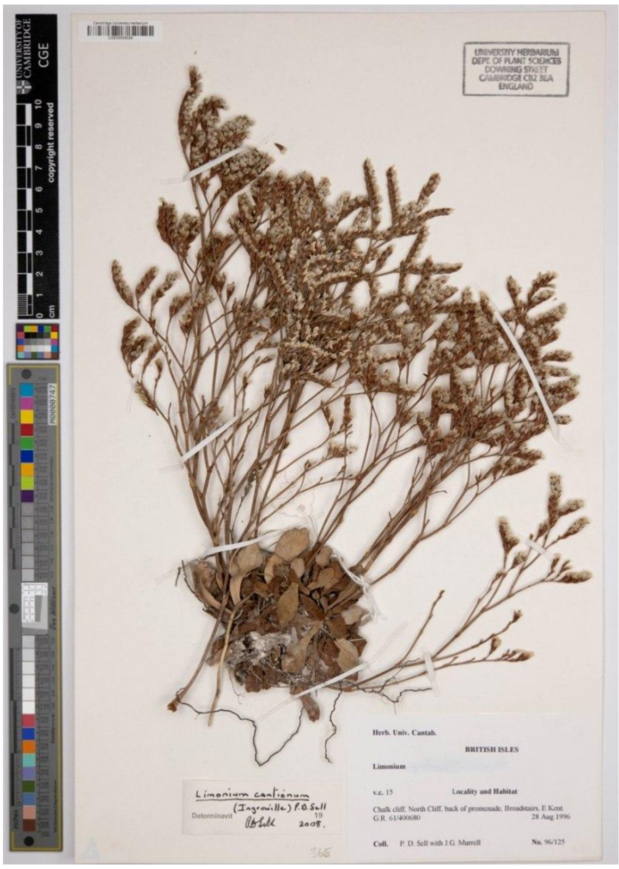
Characters for *L. calcicola*	Sell & Murrell description
Flowering stem height	10-35cm
Branching	For 2/3 stem, at 40-50°
Leaf width	5-15mm
Leaf length	15-25mm
Petiole length	10-20mm, rather narrowly winged
Stem diameter	Up to 1.5mm
Spikes	12-35mm



Site	**Grid reference**	**Site status**	**Record date**	**Recorder or source**	**Comments**
Limonium calcicola					
Folkestone	TR23 [inferred]		(1) 1834 (2) August 1833	(1) Specimen CGE00055006 (2) Specimen CGE00002197	(1) As *Statice spathulata*, re-determined as *L. calcaricola* by PDS, 1996. (2) As *Statice spathulata*, re-determined as *L. calcaricola* by PDS, 2008.
Samphire Hoe	TR23Z [inferred]	SSSI	8 July 2005	PHO, specimens (a) CGE00055004 and (b) CGE00055010	(a) Growing on Channel Tunnel spoil at Samphire Hoe, and (b) base of cliff at west end of Samphire Hoe (where railway is in tunnel), both determined by PDS as *L. calcaricola*, 2008. [*L. binervosum* also present at (b).]
Samphire Hoe	TR2838		13 August 2024	PAH & ACL	TR 28440 38780, base of chalk cliff, at western end of Samphire Hoe Country Park, by railway tunnel.
Dover	TR34 [inferred]		(1) July 1890 (2) July 1874 (3) 1867 (4) 21 June 1827	(1) FRT, specimen CGE00055008 (2) FJH, specimen CGE00055013 (3) FBr specimen CGE00055007 (4) JSH, specimen CGE00002199.	(1) Dover, as *Limonium occidentale*, re-determined as *L. calcaricola* by PDS, 1996. (2) Dover Cliffs, labelled by ESM, determined as *L. calcaricola* by PDS, 1996 (3) Dover Cliffs, as *Statice binervosa* α *occidentalis*, re-determined as *L. calcaricola* by PDS, 1996. (4) Determined as *L. calcaricola* by PDS, 1996.
Dover	TR34F [inferred]		(1) 28 August 1878 (2) 1835 [inferred]	(1) CB, specimen CGE00055005 (2) WC, specimen CGE0005045	(1) Chalk cliffs under the Castle, Dover, as *Statice binervosa* var. a *occidentalis*, re-determined as *L. calcaricola* by PDS, 1996. (2) Dover, as *Statice spathulata / occidentalis,* re-determined as *L. calcicola* by PDS, 1996 and designated holotype [date of collection inferred from other Christy records].
St Margaret's	TR34S [inferred]		30 July 1884	HTM, specimen CGE00055014	St Margaret's, as *Limonium occidentalis*, re-determined as *L. calcaricola* by PDS, 1996
St Margaret's Bay	TR3644	SSSI	29 August 1996	PDS & JGM, specimens CGE00055011, CGE00055011	TR 368 443, chalk cliff south end of harbour, determined as *L. calcaricola* by PDS.
'Cliffs near Deal' [Oldstairs Bay?]	TR34 [inferred]		1885	HTM, specimen CGE00055044	Cliffs near Deal, as *Statice occidentalis*, four plants on one sheet, determined as part *L. calcaricola*, part *L. binervosum* by PDS, 1996.

Limonium cantianum (Ingr.) P.D. Sell (Kent Sea-lavender)

Kent Sea-lavender is probably an endemic, limited to East Kent, but ranging from the chalk cliffs at St Margaret's Bay north to Thanet and (but perhaps no longer) at dryish saltmarsh at the two Kentish locations called Shellness (Sheppey and Sandwich/Pegwell Bay). This range points to a wider ecological tolerance than at least some of the other species considered here. The earliest record, at another Sheppey site, was in 1866 by J.T.I. Boswell Syme, although not then named as *L. cantianum*.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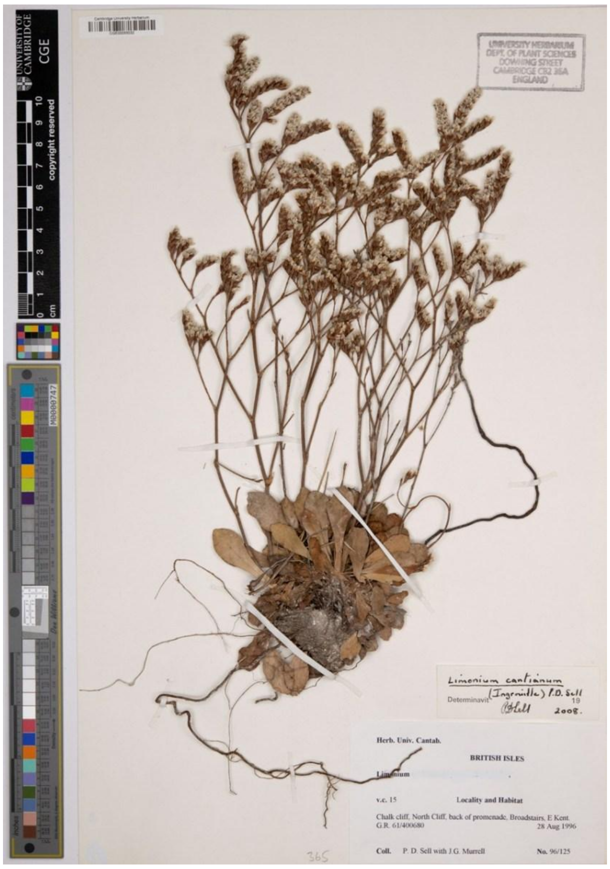
DEPT. OF PLANT SCIENCES
DOWNING STREET
CAMBRIDGE CB2 3EA
ENGLAND
Limonium cantianum
(Ingrouille) P.D. Sell
Determinavit
19
2008.
Herb. Univ. Cantab.
BRITISH ISLES
Limonium
v.c. 15
Locality and Habitat
Chalk cliff, North Cliff, back of promenade, Broadstairs, E Kent.
G.R. 61/400680
28 Aug 1996
Coll. P. D. Sell with J.G. Murrell
No. 96/125
365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DOWNING STREET
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ENGLAND
Limonium cantianum
(Ingrouille) P.D. Sell
Determinavit
19
2008.
Herb. Univ. Cantab.
BRITISH ISLES
Limonium
v.c. 15
Locality and Habitat
Chalk cliff, North Cliff, back of promenade, Broadstairs, E Kent.
G.R. 61/400680
28 Aug 1996
Coll. P. D. Sell with J.G. Murrell
No. 96/125
365

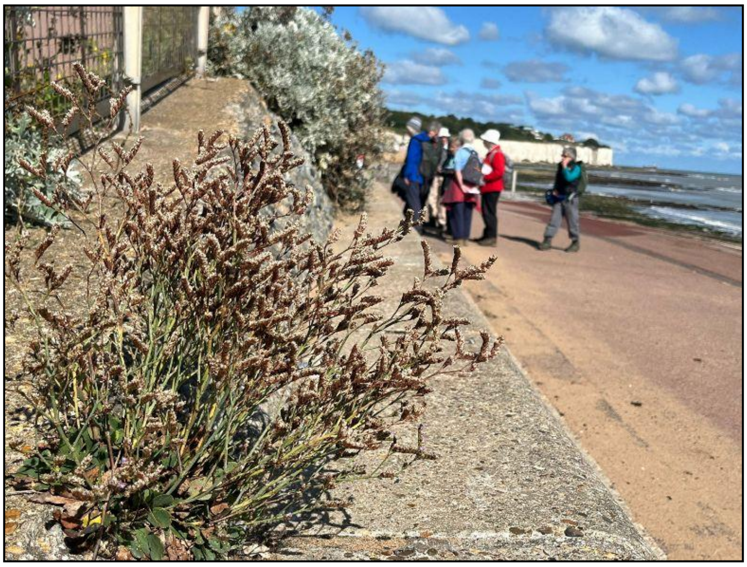
Cambridge University Herbarium

North Cliff, Broadstairs, specimen CGE00055029 **North Cliff, Broadstairs, specimen CGE00055032**

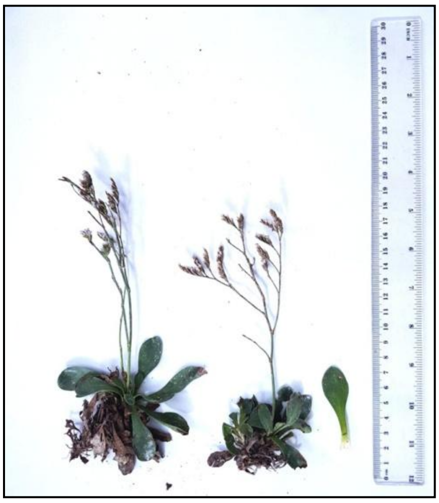
It is a medium-sized plant, whose flowering stems are described as forming a dense cushion. The stem diameter is within the same range as that of *L. altum* and *L. sanctamargaritense*, but the stems are not side-swept as with the latter species and the petiole length is shorter than that of *L. altum.* It is possible *that L. cantianum* encompasses a range of variation that has two differentiable elements, a smaller and larger plant.

Characters for *L. cantianum*	**Sell & Murrell description**	**2024 records TR3990 6855 and TR 39925 68824**
Flowering stem height	20-30cm	25cm; another at 30cm
Branching	For most of stem, at 30-35°	For most of stem at 25-30°
Leaf width	10-20mm	12-17mm
Leaf length	22-40mm	20-32mm
Petiole length	15-20(25)mm, broadly winged	16-38mm, broadly winged
Stem diameter	1.7-2.0mm	2.0mm and another at 2.2mm
Spikes	15-30mm	12-18mm

Site	Grid reference	Site status	Record date	Recorder or source	Comments
Limonium cantianum					
Sheppey, east of Sheerness	TR97 [inferred]		August 1866	JTBS, specimen CGE00055037	Near Cheeney [Cheyney] Rock, as *Statice binervosa* α *occidentalis*, re-determined by PDS as *L. cantianum*, 2008.
Broadstairs	TR3967 or TR3968 or TR4068 [inferred]		11 September 1887	HTM, specimen CGE00055024	Broadstairs, as *Statice auriculefolia*, re-determined by PDS as *L. cantianum*, 2008.
East Clliff, Broadstairs	TR3968		(1) 12 September 2024 (2) 13 August 2024	(1) KBRG meeting. (2) PAH & ACL	(1) Chalk cliff face at TR3990 6855 and also at TR39925 68824 where they were growing at the base of the cliff and top of sea wall. Taken to be *L. cantianum.* (2) TR 39961 68138, below the chalk cliffs on side of undercliff access path. Below Eastern Esplanade, Broadstairs.
North cliff, Broadstairs	TR4068	SSSI	28 August 1996	PDS & JGM, specimens CGE00055025-36, CGE00055038-39, CGE00055040-41	TR 400 680, chalk cliff, North Cliff, back of promenade, where it is the common species. Specimens CGE00055040-41 with this grid reference are marked 'Chalk cliff south end of harbour, back of promenade'. Sell & Murrell (2018) notes that it grows with *L. altum*. Also present is a smaller plant with shorter leaves and petioles placed under *L. cantianum* which may warrant separation (and which may be found at south end of harbor, perhaps equating to specimens CGE00055040-41, even though given the same grid reference. A Sheppey plant bears similarities.
Broadstairs	TR3967 or TR3968 or TR4068 [inferred]		11 September 1887	HTM, specimen CGE00055024	Broadstairs, as *Statice auriculefolia*, re-determined by PDS as *L. cantianum*, 2008.



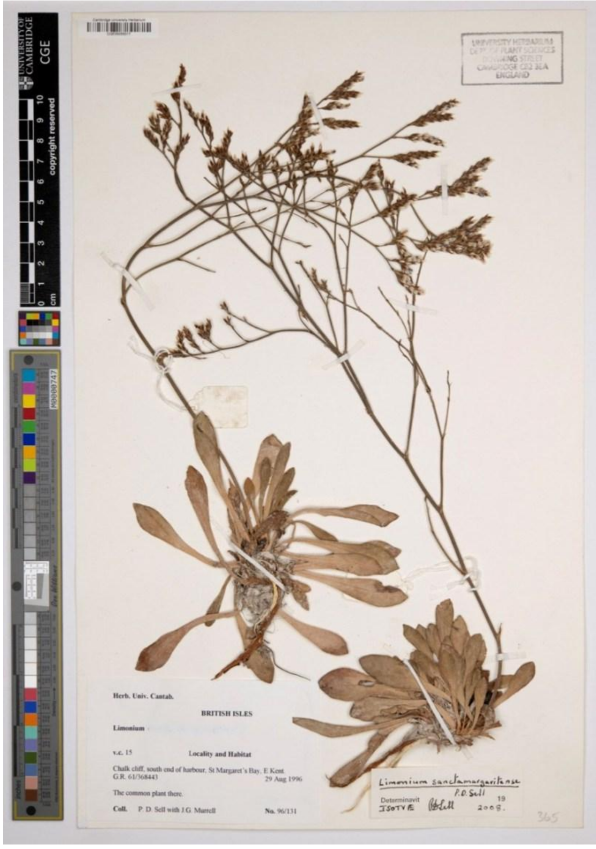
East Cliff, habitat, photo by Owen Leyshon 12 SDeptember 2024



East Cliff, specimen, photo by Sue Buckingham, 12 September 2024

Limonium sanctamargaritense P.D. Sell (St Margaret's Bay Sea-lavender)

St Margaret's Bay Sea-lavender is an endemic and a very rare species, currently known only from the chalk cliffs at the south end of the harbour, St Margaret's Bay, where Sell & Murrell (2018) refers to it as the only species of Sea-lavender (although Peter Sell determined a plant also from this location as *L. calcicola*).



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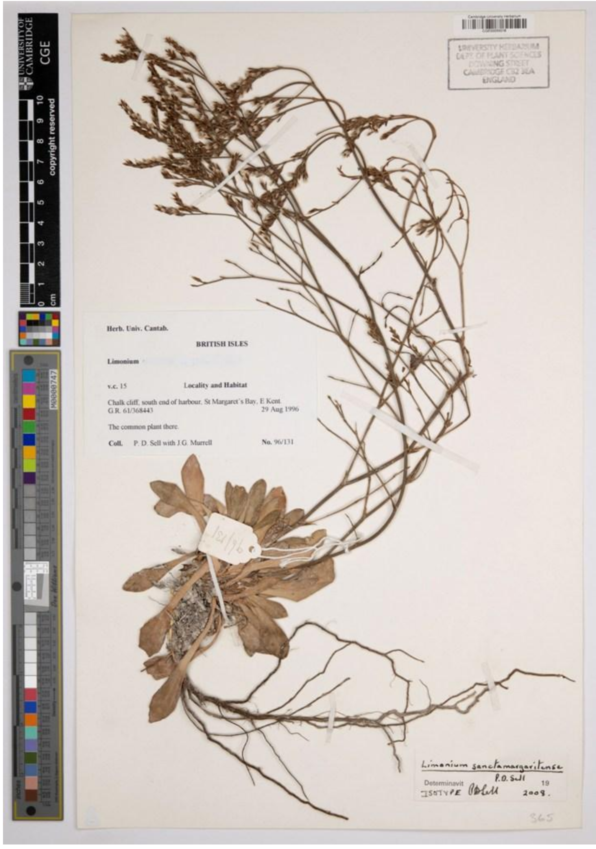
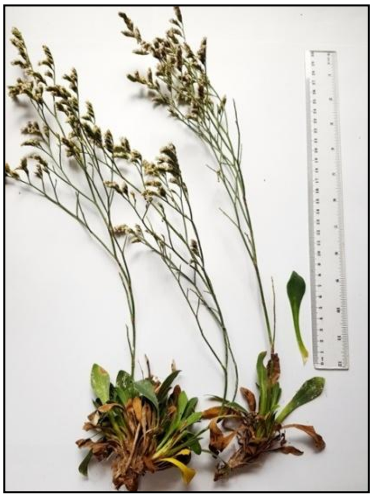
St Margaret's Bay, specimen CGE00055016



St Margaret's Bay, specimen CGE00055017

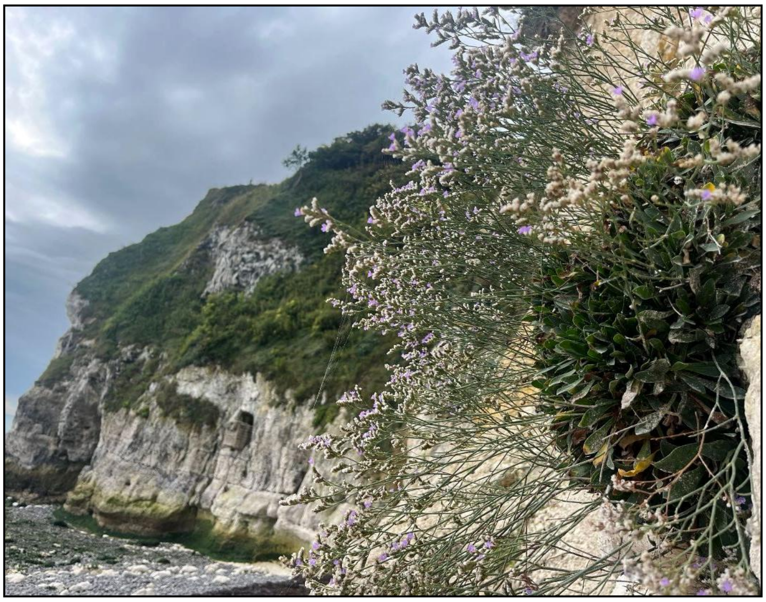
It is a tall plant, having stems with flowering branches all turning to one side as well as ascending or curving at a close angle, which should distinguish it from other species.



St Margaret's Bay, specimen, photo by Sue Buckingham, 4 September 2024

Characters of *L. sanctamargaritense*	**Sell & Murrell description**	**Records by KBRG meeting of 4 September 2024**
Flowering stem height	30-40cm	39-42cm
Branching	Sterile branches reaching low down; all branches turning to one side, at close angle to stem	Sterile branches reaching low down; all branches turning to one side, at close angle to stem, c.30°
Leaf width	8-15mm	6-16mm
Leaf length	20-40mm	20-37mm
Petiole length	20-50mm, broadly winged	26-45mm, broadly winged
Stem diameter	1.8-2.0mm	1.5-2.4mm
Spikes	18-25mm	c.20mm

Site	Grid reference	Site status	Last record date	Recorder or source	Comments
Limonium sanctamargaritense					
St. Margaret's Bay	TR3644	SSSI	(1) 4 September 2024 (2) 13 August 2024 (3) 29 August 1996	(1) PAH & ACL (2) KBRG meeting (3) PDS & JGM, specimens CGE00055015, CGE00055016, CGE00055017, CGE00055046.	(1) Clumps seen on chalk cliffs at the southern end of St Margarets Bay. Their height, branching and leaf measurements conform with those given in Sell & Murrell for *Limonium sanctamargaritense*. An accessible clump at TR 36758 44316, 3 clumps together in a shallow cave at TR 36754 44289 and 45-50 clumps at TR 36754 44289 on the cliff face south of the end of the beach promenade. Accessible plants examined were conspicuously tall at 39-42 cm, with sterile branches reaching low down and all branches turning to one side at a close angle to the stem, c. 30 degrees. Leaf width 6-16mm, leaf length 20-37mm. Petiole length (difficult to differentiate) 26-45 mm, broadly winged. Stem diameter 1.5-2.4mm and spikes about 20mm. (2) TR 3674 4428, chalk cliffs, southern end of beach. (3) TR 368 443. Cliff at south end of harbour The only species at this site.
Oldstairs Bay	TR3847 [inferred]			Sell & Murrell (2018)	



St Margaret's Bay, habitat. Photos by Owen Leyshon, 4 September 2024

The *Limonium* accounts have benefited from the kind permission of Cambridge University Herbarium to use the herbarium specimen illustrations; and the help of Lauren Gardiner and Amber Horning is gratefully acknowledged.

Linaria repens (L.) Mill. (Pale Toadflax)

vc 15; perhaps gone from vc 16

Rarity / scarcity status

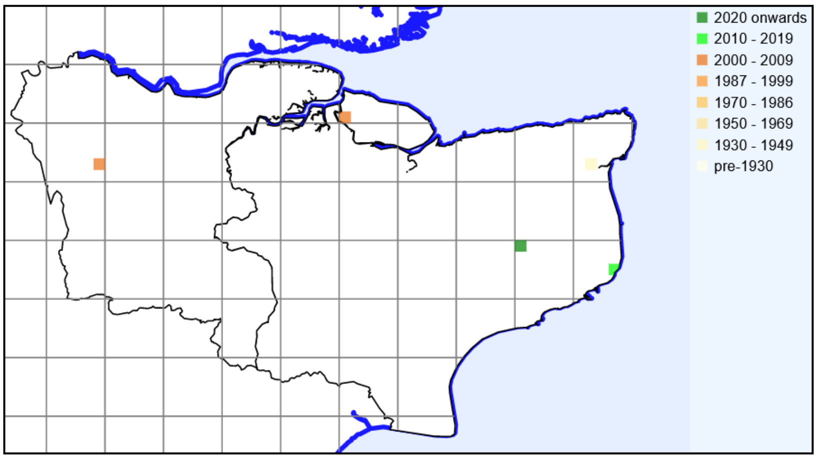
Linaria repens is an archaeophyte, or ancient introduction, widespread but scattered in Great Britain, primarily in the west, but scarcely extending to Ireland. Its conservation risk status in both Great Britain as a while and in England is one of 'Least Concern'. Its relative scarcity across eastern England is manifest particularly in Kent, where it is, and always appears to have been, **rare**.

Account

Pale Toadflax was first noted in Kent by William Hudson, in his *Flora Anglica*. The first edition gives a Cornish record for '*Antirrhinum repens*' and then mentions '*Antirrhinum monspessulanum*', 'Habitat *in arvis prope* Gad's-hill, *in* Cantio' [it grows in fields near Gad's-hill, in Kent']. However, from the second edition (1778) onwards, Hudson treated the two names together and in any event *Linaria* (*Antirrhinum*) *monspessulana* is now regarded a synonym for *L. repens*. Hanbury & Marshall (1899) mention this and five other records, nearly all for West Kent. They regarded it as a very rare plant of banks and waste ground, usually on chalk.

Barham. Photos by Lliam Rooney, 7 September 2011

Whilst there are subsequent records, most are unlocalised and there is little to suggest continuity, other than a period from 1936 to 1958 when it was known at a cindery former railway track at Richborough Port. Philp (1982) gave five tetrad records, describing the plant as native (as Floras did at the time), but that some of the records might refer to escapes from cultivation. Philp (2010) gave only one tetrad record, and that was for casual plants on waste ground. The only site for which there is evidence of continuity beyond short-term is that on a chalk bank comprising a roadside nature reserve at Barham. The reserve holds a good chalk grassland flora, which includes *Briza media* (Quaking-grass), *Centaurea scabiosa* (Greater Knapweed), *Helianthemum nummularium* (Common Rock-rose) *Inula conyzae* (Ploughman's-spikenard) and *Pimpinella saxifraga* (Burnet-saxifrage). This might suggest a near-native context for the species; but it is currently considered to be native in Europe only from north Spain and north west Italy to north west Germany. Our 2010-24 records comprise only the Barham colony and a patch at St Margaret's at Cliffe which does not appear to have wild status.



Linaria repens **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Linaria repens is a perennial, preferring a well-drained substrate, which may be stony or provided by walls or (as with Barham) dry, calcareous ground.

The hybrid with *Linaria vulgaris* (Common Toadflax) – *Linaria* x *sepium* – is known from the shingle beach at Lade (TR 0862 2028), where first discovered in 2009. Here it grows as a large patch, with variable plants which appear to have segregated so as to show two main forms, one branched and with pale-coloured and unshowy flowers, the other less branched, earlier flowering, with bright yellow flowers, shorter spike and with its lower leaves somewhat incurved. *Linaria repens* has not been seen here, so the origin of the hybrid is somewhat mysterious. It is seldom cultivated these days; although there is still the possibility that it had been grown in this neighbourhood, where many garden plants escape on the shingle and *Linaria vulgaris* is present. The hybrid was also found at Richborough Port by Francis Rose in 1946, but the *Linaria repens* parent had been there for some time.

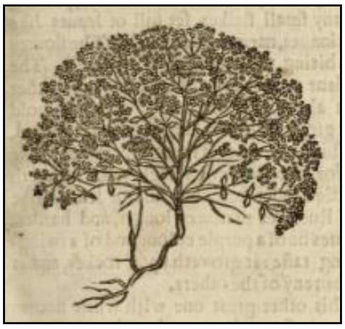
Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Chislehurst (metropolitan vc16)	TQ4469		1983	JRP	TQ 444 699, naturalised in church yard.
Halstead	TQ4862		26 September 2004	GK	TQ 488 625, casual, on soil heaps at Broke Hill golf course between the club house and Cadlocks.
Tunbridge Wells	TQ53Z		After 1970, before 1981	Philp (1982)	
Hilldenborough	TQ54T		After 1970, before 1981	Philp (1982)	
Near Sevenoaks	TQ55D		After 1970, before 1981	Philp (1982)	
Magpie Bottom	TQ55K		After 1970, before 1981	Philp (1982)	
Rushenden	TQ97A		22 June 2000	EGP & DG (Philp, 2010)	Casual plants on disturbed waste ground.
Barham	TR2419	KWT RNR	(1) 9 May 2024 (2) 1 August 2020 (3) 20 August 2013 (4) 28 August 2010 (5) 23 July 2009 (6) 1990	(1) SC (2) SB (3) CO (4) FB, DM, JS (5) CO (6) JP	(1) Healthy colony on Roadside Nature Reserve TR 2130 4973. (2) Numerous plants spread over a square metre of KWT RNR TR 2127 4976. (3) Three groups of 2, 5 & 18 amongst many other plants on roadside bank just SE of crossroads at TR 213 497. No noticeable change in distribution. Total 25 flowering plants. (4) 40 plants at RNR, The Street, Barham TR 213 497. (5) 40 flowering plants counted on north roadside bank at TR213497 just SE of crossroads. (6) Road verge near junction with Gravel Castle Road.
St Margaret's	TR34S		(1) 14 October 2017 (2) After 1970, before 1981	(1) DCh (2) Philp (1982)	(1) TR 37113 44919, on steep chalky bank at end of garden dropping down to road. Considered unlikely to have been planted, but nonetheless within garden. (2)-

Linum radiola L. (*Radiola linoides* Roth) (Allseed)

vc15 and 16

Rarity / scarcity status

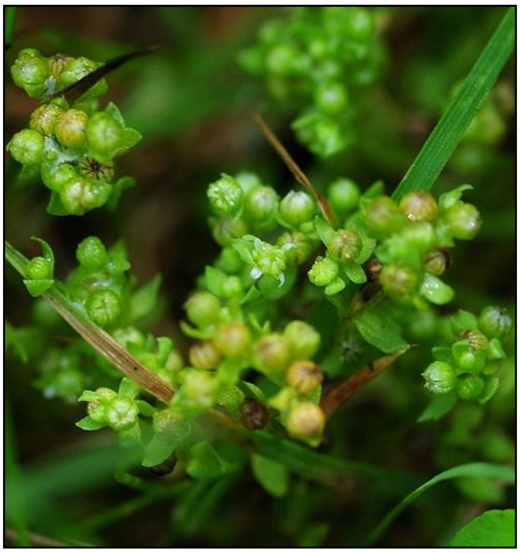
Linum radiola is a minute plant of open, acid ground, especially woodland rides, and it grows scattered across much of the British Isles, but especially in more coastal areas other than those of east England. It has been regarded as **Near Threatened** in Great Britain as a whole. In England, however, it is **Vulnerable** to the risk of extinction, as a comparison of the species' area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 41% in the likelihood of its being recorded. The losses have been largely of inland sites. In Kent, it is **scarce**. It is a Kent axiophyte and so is regarded as an indicator of good habitat.



From Gerard's Herball (1633), ed. Thomas Johnson.

Account

The first published Kent record for Allseed is by Thomas Johnson in his *Descriptio Itineris* (1632) en route from Canterbury to Sandwich, apparently when reaching the sandy soils of woodland east of Canterbury. Johnson was also responsible for the 1633 edition of Gerard's *Herball*, which showed that he already knew the plant: 'I found this in Kent on a Heath not farre from Chisle-hurst, being in company with M^{r} *Bowles* and divers others, in July, 1630'. He described it as follows: 'The whole plant seemeth as it were covered over with seeds or graines... I have not seene many plants of this, but all that I ever saw never attained to the height of two inches'. Other early records were also in sandy/gravelly locations: '*On sandy Banks between* Ore *and* Luddenham – *common*' (Edward Jacob, *Plantae Favershamienses*, 1777)[372]; 'Willesboro and Brabourne Leas' (Gerard Smith, *Catalogue*, 1829); Keston Mark or Common, *Substratum – Gravel'* (Daniel Cooper, *Flora Metropolitana*, 1836).



Chingley Wood Photo by Lliam Rooney, 11 August 2018

Hanbury & Marshall (1899) considered it to be a rather rare native of damp sandy ground. A much fuller account of its habitats and distribution was given by Francis Rose in his manuscript *Flora*: a native of damp open loamy soil in woodland rides, often with *Centunculus* (*Lysimachia minima*), almost confined now to the central High Weald, where it is still locally common: formerly possibly not infrequent on the Folkestone Sand and on the Eocene sands; outside the High Weald, it should occur in the Tonbridge-Penshurst-Cowden and the Hawkhurst-Rolvenden-Tenterden areas. The bulk of his records were in the High Weald, with sighting in the 1940s and 1950s in Angley Wood, Bayham, Bedgebury Forest, Brewers Wood, Chingley Wood, Chittenden Wood, Combwell Wood, Copden Wood (E. of Sissinghurst), Dandle Wood, Great Sandhurst Wood, Kilndown Wood, Oaks Wood (Cranbrook), Pembury Wood, Roundshill Park Wood, and Sissinghurst Park Wood.

This core area supplied the only records for Philp (1982), amounting to just six tetrads. Allseed was then described as very rare, along damp woodland rides, but easily overlooked and in any event rather uncertain in its appearance, disappearing from known sites when the surrounding trees produce too much shade. Philp (2010) expanded the number of records to nine tetrads, only two of these being the same as in Philp (1882), but all in the same general area. It is not possible to draw any conclusions about trends between the survey dates, given the small numbers and the uncertainties of the plant's behaviour.

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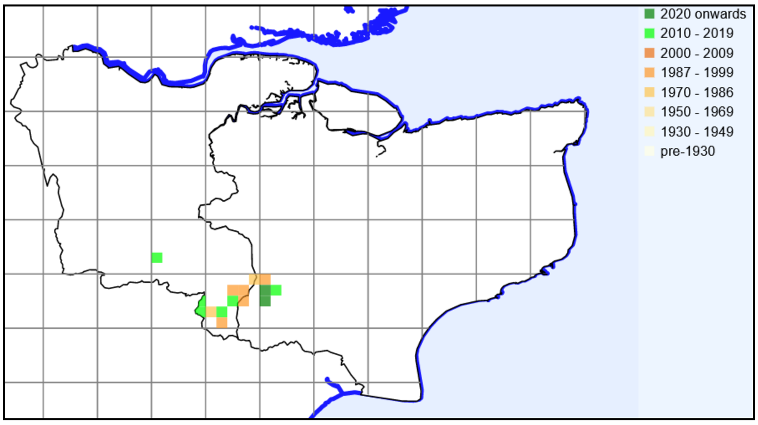
[372] If correctly named (Francis Rose had doubts about this; it is outside the normal distribution pattern, which is mainly north west Kent and Wealden).

Chingley Wood. Photo by Lliam Rooney, 11 August 2018

Our 2010-24 records, although fewer with eight tetrads (12 monads) again should not be interpreted as showing significant change, except for a 2014 record at Pembury Walks which, although outside the area of records given by Philp (1982) and Philp (2010), is within the range of woodlands within which Allseed was known in the 1940s and 1950s.

***Linum radiola* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Allseed[373] is a tiny annual of damp, open, infertile, acid ground. Its habitat range in other parts of the British Isles (draw-down zones, grassy cliff slopes, pond edges, dune slacks, soil-filled rock crevices) appears wider than experienced in Kent, where it is largely a plant of acid forest rides. The places where it grows may only have ephemeral suitability, and become adversely affected by overshading by growing trees or by competition from establishing herbs. Seeds are apparently able to persist in the soil after conditions have become unsuitable, with the potential for recolonising if the site reverts to damp, open ground. Allseed can take advantage of ephemeral conditions through its low nutrient demand, the ability to flower without much leaf growth, and the capacity to set seed within a few weeks of germination (which tends to follow favourable temperatures and the receding of any water cover within the site).

Lysimachia minima (Chaffweed) has similar habitat requirements and we have often recorded them together (see also the register account for that species).

Hemsted Forest, habitat (KBRG meeting). Photo by Sue Buckingham, 29 July 2021

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[373] General information here is taken from Stroh, P.A. (2015). *Radiola linoides* Roth. Allseed. Species Account. Botanical Society of Britain and Ireland.

Allseed, when mature, looks much as its name suggests: it appears to be all seed. It is unlikely to be confused with anything other than *Polycarpon tetraphyllum* (Four-leaved Allseed), but has two leaves, rather than *Polycarpon*'s four; and flowers with four petals and sepals, rather than *Polycarpon*'s five. Also, the latter's recent spread into Kent has been largely in urban habitats, often coastal; and although Allseed's national distribution is fairly coastal, this does not appear to be the case in Kent.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Pembury Walks	TQ6142	RSPB reserve	16 August 2014	SB	Estimated 20 to 30 plants at TQ 6189 4229 with *Lysimachia minima* on a damp path through chestnut, alder and birch coppice. Associated plants: *Prunella vulgaris, Potentilla erecta, Plantago major* and *Ranunculus flammula*. (It was difficult to distinguish between groups of plants and individuals, without damaging them).
Chingley Wood	TQ6833, TQ6834		(1) 11 August 2018 (2) 10 August 2018 (3) 1991-99	(1) KBRG / KFC meeting (2) SL (3) EGP	(1) TQ6833; TQ6844, quite frequent on damp paths of Chingley Wood. (2) (a) TQ 6893 3417, open track through woodland. (b) TQ 691 340, a few plants on open damp sandy track bordered to west by Sweet Chestnut coppice cut this Spring. (3).Given as TQ63X, Scotney, and TQ63W, Chingley Wood; most likely TQ6834 and TQ6433.
Bedgebury / Combwell	TQ73B	Combwell Wood is SSSI	(1) 26 July 1979 (2) After 1970, before 1981	(1) FR (2) Philp (1982)	(1) TQ7133, Combwell Wood. (2) Given as TQ73B.
West Wood, Flimwell	TQ7239		(1) 1996 (2) 20 August 1986	(1) PHa (2) RoF, LBB	(1).TQ7239. (2) TQ722 308, associated species with *Lobelia urens*
Bedgebury Forest	TQ7233, TQ7332, TQ7333	Access land	(1) 13 August 2023 (2) 17 August 2017 (3) 18 July 2017 (4) 1991-99 (5) After 1970, before 1981	(1) SL (2) KBRG meeting (3) DCh (4) EGP (5) Philp (1982)	(1) (a) Bedgebury Forest, Starvegoose Bank, TQ 72431 32803. Along wide track. (b) TQ 72694 32339. Damp corner of forest track. (2) (a) Frequent on a damp grassy ride with a little *Lysimachia minima* from TQ 73182 32794 eastwards on that ride to the boundary of the monad and into TQ7232. (b) With *Lysimachia minima* on a damp ride at TQ 7285 3281, TQ 7280 3279. (3) TQ 73085 33075. (4)& (5) As TQ73G.
Bedgebury / Angley	TQ73M		1991-99	EGP	
Angley Wood	TQ7535		(1) 12 August 2014 (2) 1 September 2007 (3) 1991-99	(1) AG, JP, MT (2) JP (3) EGP	(1) Angley Wood, TQ 7584 3592, 15 plants in woodland ride with *Lysimachia minima.* (2) Hundreds of plants in wide bare sandy ride at

					western end of the wood. (3) Given as TQ73N, Iden Green, but assumed to be TQ7535.
[Angley Wood]	TQ73S		1991-99	EGP	Given just as TQ73S, but probably TQ7635, SE corner of Angley Wood.
Angley Wood	TQ7636		(1) 1 August 2007 (2) 1991-99	(1) DMi, JP (2) EGP	(1) (2) Given just as TQ73T, but probably TQ7636, north Angley Wood
Cranbrook Common	TQ73Z		After 1970, before 1981	Philp (1982)	Given just as TQ73Z; may be Brewers Wood.
[Hemsted Forest]	TQ83C		After 1970, before 1981	Philp (1982)	Given just as TQ83C; probably Hemsted Forest / Chittenden Wood.
Sissinghurst	TQ83D		After 1970, before 1981	Philp (1982)	Given just as TQ83C; may be Roundshill Park Wood.
Sissinghurst	TQ83E		1991-99	EGP	Given as TQ83E Sissinghurst Castle [NB there is a 1957 record within this tetrad, at TQ 801 388 (Saw Lodge Wood)].
Hemsted Forest	TQ8135	Access land	(1) 29 July 2021 (2) 29 July 2021	(1) KBRG meeting (2)SL	(1) At least a hundred tiny plants and probably more on a damp forest ride at TQ 8165 3556 with *Centunculus minimus*, *Potentilla erecta* and *Succisa pratensis*. (2) Hemsted Forest, Dockenden, TQ 8157 3550. Damp edge of public footpath.
Hemsted Forest	TQ8136	Access land	29 July 2021	KBRG meeting	In good quantity at TQ 81788 36070 with *Centunculus minimus*.
Causton Wood	TQ8236		(1) 25 July 2013 (2) 1991-99	(1) BW (2) EGP	(1) TQ8236. (2) Given just as TQ83I, Causton Wood; but assumed to be TQ8236.

Lobelia urens L. (Heath Lobelia)

vc 16

Rarity / scarcity status

Heath Lobelia is very local in south England, by 2002 having declined from 19 historic populations to six, of which Kent provided the easternmost colony. It is regarded as **Vulnerable** to the risk of extinction in England (and Great Britain as a whole) and is **nationally rare**. Our population is at Flimwell, in the administrative county of East Sussex, but it lies within botanical vice county 16, West Kent[374], and for Kent purposes, it is very **rare**. It is a Kent axiophyte, an indicator of good habitat.

Account

The only fully documented claim to this species in the administrative county of Kent was a communication by W. Thomson in September 1850 to the *Phytologist*[375] that a single plant had been found by the wife of the Rev. J. Dix by a path in coppiced chestnut near Ashford, and that the latter considered that there was no apparent possibility of its having been placed there through man's instrumentality. The living plant was provided to Mr Thompson, who passed it to the editor of the *Phytologist* as proof of identity. So the credentials of the plant and finder seem beyond doubt and so, probably, was the demise of the species at that locality. But its apparent presence as a single plant is not persuasive, and the verdict of Hanbury & Marshall (1899) was 'Doubtless planted.' Dinsdale (1996)[376] was more optimistic about native status, on the basis of similarity of the habitat to the Flimwell colony 'where damp ghyll woodlands create a locally oceanic climate'. The Flimwell colony, however, is not really focused on ghyll woodland, and the assumption that the wood near Ashford was of this character is a bold one, particularly if Mrs Dix's find was near her husband's parish (Charing, where he was curate, according to the 1851 *Clergy List*).

Flimwell Photos by Lliam Rooney, 30 August 2011

There is also the possibility of a mystery site, whose status remains unresolved. Rosemary FitzGerald (1988)[377] refers to a 1976 letter which alludes to a record at or around Penshurst, unconfirmed, albeit that the plant was identified by Lady Hardinge of Penshurst (died 1979), who used to botanise with Dr. Druce. No more is known. Without any evidence to indicate this, one might consider it possible that it was introduced to the Redleaf estate.

Lobelia urens, however, was found in quantity in West Wood near Flimwell (West Kent vice county, albeit in East Sussex administrative county). A.H. Wolley-Dod in his Flora of Sussex (1937) refers to it as first noticed by Mrs E.E. Johnson in 1922, with a specimen forwarded by E.J. Bedford to the Natural History Museum, where its identity was confirmed by A.J. Wilmott[378]. Wolley-Dod referred to it as covering some acres, and increasing yearly, though varying with the season. He considered the chances of its being native were considerable, even though the late discovery and the fact of its increase might point against this (increase, of course, may be just a function of the coppicing cycle). Wilmott said he could 'see no reason to doubt the natural origin'.

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[374] This appears to have been a consequence of an error in the relevant Ordnance Survey map, 1813. See Bevan, J. (1980). Flimwell: East Sussex or West Kent? *Watsonia* **13**: 120-121.

[375] Vol. 3 (1848-1850), p.1051; and at p.ix of the preface.

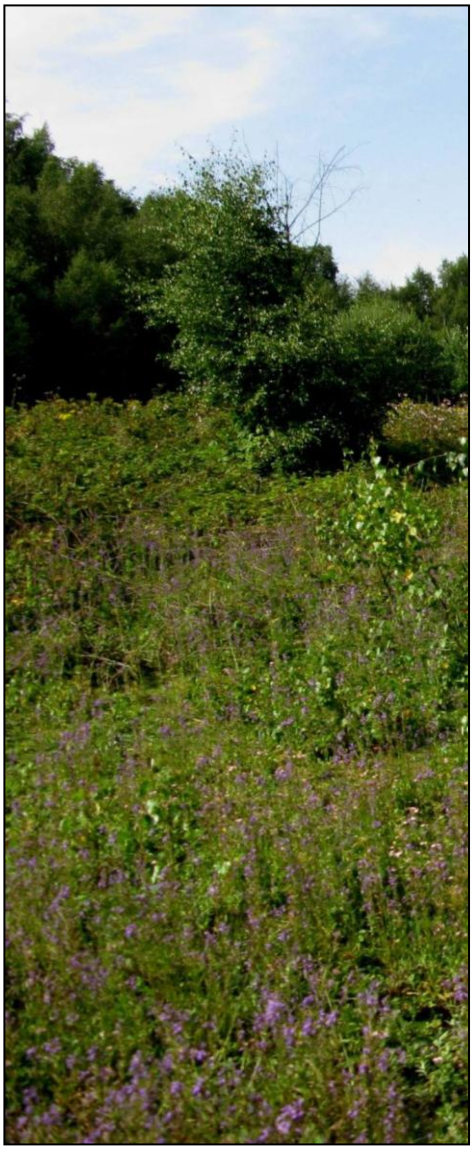
[376] Dinsdale, J.M. (1996). The conservation and ecology of the heath lobelia, *Lobelia urens* L. Ph.D. thesis, University of Plymouth.

[377] FitzGerald, R. (1988). *Lobelia urens* L. Heath Lobelia. Unpublished N.C.C. report.

[378] Wilmott, A.J. (1925). *Lobelia urens* L. in Sussex (Notes on British Plants). *Journal of Botany* **63**: 26.

There are many records for this colony, the fortunes of which may be indicated by the following selection:

- 15 October 1928, E.E. Johnson: 'In a wood close by Flimwell Vicarage. This year it is scarce and poor, last year it grew in masses, apparently liking the damp, which is curious, as I believe it is described as preferring heaths. It always seems to be in one area of the wood. In good seasons it is about 18 inches high.'
- 1946. Few plants, thinly scattered on the edges of rides within chestnut coppice (Dinsdale, 1996).
- 1981. 70-80 plants, confined to rides, chestnuts 5-10 years old (Dinsdale, 1996).
- 3 September 1985. Rosemary FitzGerald and L. Breda Burt: none seen.
- 20 August 1986. Rosemary FitzGerald and L. Breda Burt: TQ 722 308, about 200 plants along a stream and a woodman's track, in a chestnut coppice that was felled the previous winter.
- 1993. About 2,500 plants, scattered throughout bird park (Dinsdale, 1996).
- 16 August 2006. Matthew Berry: TQ 721 308, c. 50 plants along track.
- 27 October 2009. A.G. & K.A. Knapp: Grounds of old bird park. Many gone-over plants at or near TQ 72109 30875. Also c.20 gone-over plants at TQ 72094 20882.
- 17 September 2010. M. Shaw: TQ 72106 30881, several hundred plants in brambly, rabbit-grazed clearing.
- 30 August 2011. KBRG meeting: TQ 72137 30952, a few plants in wooded shade of former path; TQ 72103 30878, hundreds of plants centred here in area c.25 x 25m of abandoned clearing, most where rabbit-grazed, some in encroaching brambles and developing scrub.
- 25 July 2014. Judy Clark and Jaqueline Rose: occasional to frequent in monad TQ7230, still growing in the old Bird Park area and also growing in more open areas in the woodland and on the track; woodland not coppiced recently.
- 10 September 2014. Stephanie Mills: TQ72114 30927, over 450 plants.



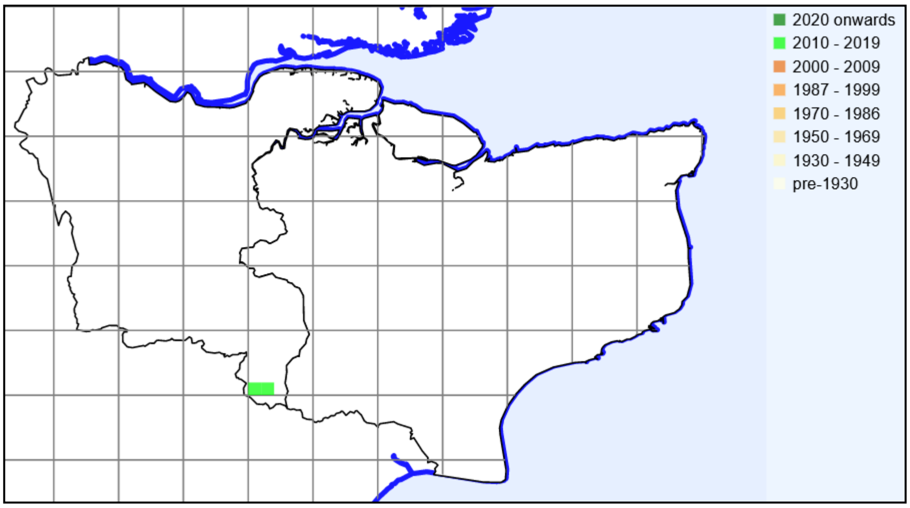
Flimwell, habitat. Photo by Sue Buckingham, 30 August 2011

- July 2019. R. Hobbs: TQ 7211 3088, 350 plants.
- July 2020. R. Hobbs: TQ 7211 3088, 540 plants.
- 28 July 2021. Holly Stanworth and R. Hobbs: TQ 72220 3708, 99 plants alongside woodland track plus TQ 7211 3088, 579 plants in meadow despite habitat becoming ranker.
- 2 August 2022. Holly Stanworth and R. Hobbs: TQ 72106 30758, two plants in glade; TQ 72220 30707, 49 plants alongside woodland ride; TQ 72100 30711, 27 plants across clearing opened up a few years before.
- 18 July 2023. Holly Stanworth and R. Hobbs: 87 plants treated as in five locations.

- August 2023. Holly Stanworth and R. Hobbs: 169 plants in meadow, TQ 7211 3088, many gone over; two by woodland ride, TQ 72201 30845; 12 by pond off woodland ride, TQ 72198 30796.
- 2024. Holly Stanworth and R. Hobbs: 69 plants under six gridreferences on 10 July; 24 more in two locations on 7 August.

From these records, it is evident that, whilst the species is capable of growing in woodland shade, it is responsive to disturbance and exposure to light as part of the coppicing cycle. The site was opened as Flimwell Bird Park in 1989-90 with lakes and bird breeding enclosures, had closed by 2009 and was subsequently (2019-20) redeveloped as Flimwell Park, a mixed use commercial/residential estate described as a sustainable woodland development. The initial clearance of woodland for the bird park apparently boosted plant numbers from 200 to 2,000[379]. Cleared ground occupied by the enclosures was probably helpful for the subsequent survival of the species – Dinsdale (1996) refers to the bird grazing and visitor trampling - and although following abandonment, these areas had been closing up with the spread of brambles, the remaining relatively clear ground had enabled Heath Lobelia to continue.

Results of site investigation during its operation as a bird park, using quadrat surveys, are given in Dinsdale (1996). A mature chestnut woodland community still existed, but it bore an impoverished ground flora, lacking *Lobelia urens*. The original community for the species, disturbed open areas in chestnut woodland, had been enlarged by the bird park development, and sampling from within and around this area indicated that this original community could be characterised as (National Vegetation Classification) M25 (*Molinia caerulea – Potentilla erecta* mire), dominated by *Juncus effusus* (Soft-rush), *Molinia caerulea* (Purple Moor-grass) and *Lobelia urens.* Two other community types were identified: species-poor areas heavily disturbed by birds at the edges of ponds, with only *Raphanus raphanistrum* (Radish), *Epilobium montanum* (Broad-leaved Willowherb) and *Lobelia urens* persisting; and grassy woodland edges dominated by *Anthoxanthum odoratum* (Sweet Vernal-grass), *Betula pubescens* (Downy Birch) and *Teucrium scorodonia* (Wood Sage).



***Lobelia urens* Kent records to 2022 mapped at tetrad level, from BSBI database.**

Lobelia urens is a perennial of infertile acid soils, generally in rough pasture and grassy heath, but often (as in this case) in woodland marginal habitats. The Flimwell site shares similar soil conditions to Bedgebury, underlain by Tunbridge Wells Sand Formation, acid and nutrient-poor, often silty/clayey. The plant overwinters as a rosette or rosettes, produced from the rhizome, and it then develops a single flowering spike from spring onwards. A large plant may produce 3-4,000 viable seeds (Devon data), which are scattered in the immediate vicinity of the plant. The optimum germination temperature is fairly high, which reflects the more southerly European distribution, southern England being at the edge of its range; moisture also assists germination. Apparently, there are spring and autumn germination peaks, but there is high seedling mortality, and only spring germinating plants are likely to achieve sufficient maturity to withstand winter frosts. Open ground is required for establishment from seed, which will respond when the seed-bank is exposed to light. Disturbance from coppicing may achieve this, but the disturbance afforded at the Flimwell site appears to be have been largely from rabbits after the abandonment of the bird park and before the 2019-20 redevelopment. The likelihood is that the seed-bank is enormous and long-lived, to over 25 years (there is an analogy with *Calluna vulgaris* here, another plant with a strategy of large seed production and seed dormancy to tide over periods of unfavourable habitat, emerging when woodland is opened up). The Flimwell site has been a good example of resurgence from the seed-bank after coppicing or clearance.

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[379] Dinsdale, J. *Lobelia urens* L. (Campanulaceae), in (ed.) Wiggington, M.J. (1999). *British Red Data Books 1 Vascular Plants*. J.N.C.C.

Heath Lobelia is not readily confusable with any other species.

Logfia minima (Sm.) Dumort. (*Filago minima* (Sm.) Pers.) (Small Cudweed)

vc15 and 16

Rarity / scarcity status

Logfia minima is widespread over the British Isles, although nowhere particularly frequent, and its conservation status in Great Britain has been one of 'Least Concern'. However, in England there is some evidence of decline, and it is considered to be **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 24% in the likelihood of recording the species. In Kent, it is not common, but is neither rare nor scarce, and it seems to be increasing, the English decline is somewhat patchy and increases elsewhere are known. It is a Kent axiophyte, and so regarded as an indicator of good habitat.

Account

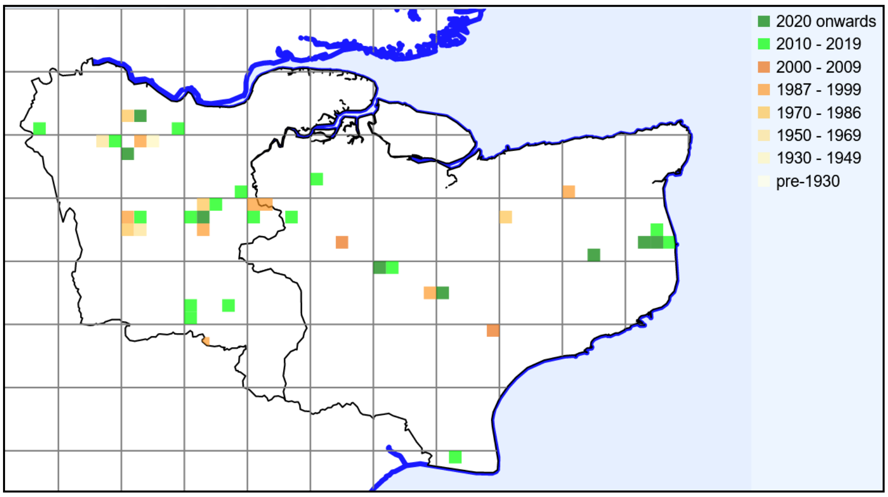
The first Kent record was probably made by Thomas Johnson in 1632 at a fairly late stage in his journey from Sandwich to Canterbury, published as *Gnaphalium minimum* Lob. However, Francis Rose, in the 1972 edition of Johnson's *Descriptio Itineris*, considered it at least possible that the plant was *Gnaphalium uliginosum* (Marsh Cudweed) instead. Otherwise, the earliest reference would appear to be by Thomas Forster, in *Flora Tonbrigensis* (1816), who found it 'In sandy and stony places, on Tonbridge Wells Common, near the Rocks, and elsewhere'. Hanbury & Marshall (1899) regarded it as thinly spread over almost the whole of Kent, on heaths, sandy or gravelly ground.

Farthing Corner. Photos by David Steere, 14 August 2016

However, by the time of Philp (1982), the thin spread had become much more attenuated, reduced to 12 tetrad records, and the species was regarded as very local and scarce on sandy soil at heaths, quarries and waste ground. Apart from a few outliers, Small Cudweed followed the line of the sands of the Folkestone Formation which traverse the county just south of the North Downs and the Gault Clay.

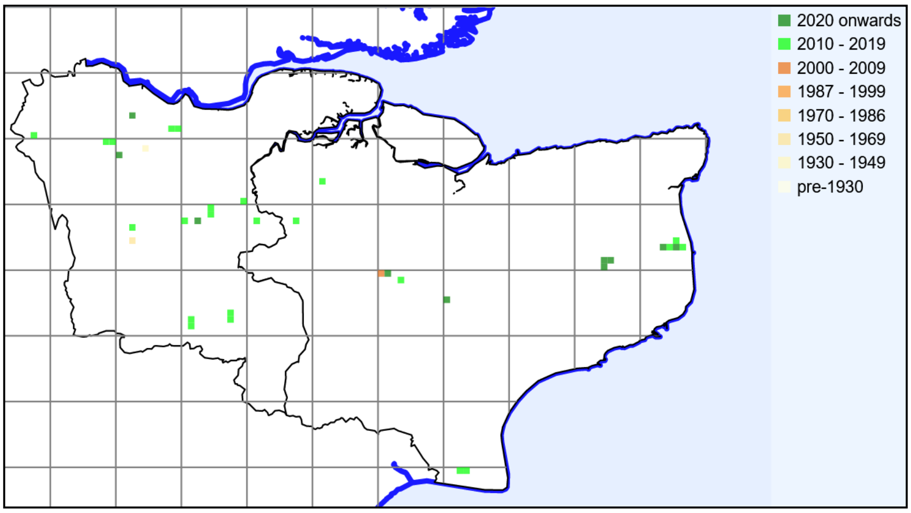
The distribution was very similar in Philp (2010), but with 15 tetrad records, an apparent increase of 25%. Only four of the tetrads are the same in both the 1971-80 and 1991-2005 surveys, so that it is not a case of the later survey having added a few sites to a continued presence at the earlier sites. It looks as though there may be a certain amount of coming and going, with this annual species appearing where disturbance creates bare sandy areas on the Folkestone Formation.

The 2010-24 records, however, amount to 25 tetrads (33 monads), in comparison with the 15 tetrads of Philp (2010), and so the 1991-2005 and 2010-19 surveys both show incremental increases.



***Logfia minima* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The 'come and go' nature of Small Cudweed is emphasised by viewing distribution at tetrad level, so that records of different date classes may be compared. This is not so readily done with monad level mapping, as it emphasises only recent records, given that monad recording only became the norm in Kent from 2010.



***Logfia minima* Kent records to 2024 mapped at monad level, from BSBI database.**

The later records are surprising in comparison with the earlier ones, for they provide a greater emphasis on outliers than the previously recognised linear distribution along the Folkestone Formation. It is possible that the linear distribution will re-emerge more fully with further survey work, although some records may depend upon sand quarries which have been infilled or have become less accessible.

Habitat (colliery shale), Betteshanger. Photo by Sue Buckingham 5 August 2020

The outliers merit further comment. Those records near the east coast relate to Betteshanger (formerly Fowlmead) Country Park, where *Logfia minima* is very abundant on the sharp-draining colliery spoil which virtually lacks nutrients, as does the sand which is the species' usual growing medium; also a site on a similar substrate which succumbed to residential development (Betteshanger Grove) in 2022. The Dungeness records derive from consolidated sand/shingle at Lydd Ranges, normally inaccessible MOD land. Records in the Pembury/Tudeley area are for sandy track-sides and places where surface scraping had taken place to encourage the growth of *Calluna vulgaris* (Heather); the geology here is Tunbridge Wells Sand. One of the north western outliers is for old gravel workings at Dartford Heath (Hanbury & Marshall, 1899, mention the species' presence on Dartford Heath and Common), but some of the Tertiary sands south of here ought also to be capable of yielding records, for there are finds in the 1990s at Farningham Woods and Crockenhill not represented in Philp (2010). Another north western outlier is at the former Beckenham Place golf course, where plants were growing on the imported sand in bunkers. A similar habitat also accounts for finds on a closed golf course between Brenchley and Paddock Wood. Presence on consolidated sand/shingle gravel at Dungeness is unsurprising, given that it was recorded here for Philp (1982).

Habitat (sand, Folkestone Formation), Eureka Park, Ashford. Photo by David Steere, 5 July 2020

As *Logfia minima* is a small annual, it is reliant upon open ground and low competition, generally deriving from an initial level of disturbance. Presumably this brought in the small, straggling colony observed by the M20 between Nepicar and Addington by Feltwell & Philp (1980)[380], although this was some 19 years after motorway construction; and the species appears in adjoining sand quarries where disturbance has, while working continues, been much more substantial. Infertile sandy or gravelly substrates assist in minimising competition and the species can be seen on old sand quarry slopes in Kent, where the steepness and infertility has slowed vegetation succession. It sometimes shares its habitat with *Filago germanica* (Common Cudweed), a species with some similarity; *L. minima* is generally a smaller, less branched plant. Other differences between these species are set out in the account for *Filago germanica* (*q.v.*).

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[380] Feltwell, J. & Philp, E. (1980). Natural History of the M20 motorway. *Transactions of the Kent Field Club* **8(2)**: 101-114.

Lotus angustissimus L. (Slender Bird's-foot-trefoil)

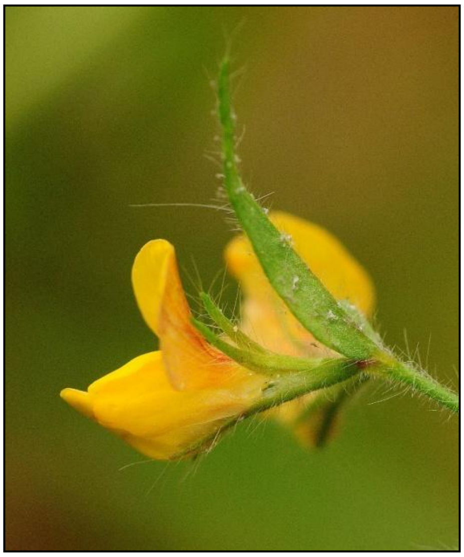
vc 15; gone from vc 16

Rarity / scarcity status

Lotus angustissimus is a very local plant of southern England and the Channel Islands, regarded as **Near Threatened**, both in England and Great Britain as a whole, and now **nationally scarce**. Between 1980 and 1999, it had been seen in 50-60 locations in Britain, mostly in Devon and Cornwall, but more recently the number has been assessed at less than 30. The intermittency of its Kentish presence has been such that it was placed on the 'probably extinct' list, but following its rediscovery in 2016, it is assessed as **rare**.

Account

The first published occurrence in Kent was a find by B.D. Jackson and the Rev. W.W. Newbould[381] at the Isle of Grain, where it was in some quantity, although close-bitten by sheep. This appears to have been a grassland coastal habitat akin to those which are usual for the species in south west England. Subsequent finds near Gravesend (mentioned in Hanbury & Marshall, 1899) and Stone Marshes (by W. Watson, mentioned in Francis Rose's MS *Flora*) may have been of comparable character. A find at a gravel pit at Sevenoaks c.1977 was dismissed by Philp (1982) as probably introduced there with other species deliberately planted. None of these occurrences appears to have been persistent (Francis Rose mentioned a report of it having been re-found at Grain, only to dismiss this as in error)[382].



Trenleypark Wood. Photo by Lliam Rooney, 11 August 2016

However, three populations have had a longer history, none of them relating to classic coastal habitat. One of these was at Waystreet Farm, Hernhill, where found by Francis Rose in 1955 on a bushy bank on Thanet Sand. There were 35 plants present around the edges of a heavily rabbit-grazed scrubby bank, when visited by Rosemary FitzGerald and Andrew Henderson in 1985 (grid reference given as TR 058 614½, although TR0578 6144 looks more likely). No later record can be traced; the area was reported as full of nettles in 1995.

Littlebourne. Photo by Steve Coates, 1 August 2023

A further population was found by Francis Rose in 1945 at scrubbed-in gravel pits at Swanton Farm, Littlebourne, TR 203 591, and recorded there in 1949, 1950, 1953 and 1960. This is currently the transmitter site at Court Hill, a transmitter mast having been erected in 1983 on what was then an old sandpit and farm tip. *Lotus angustissimus* survived the changes and its population in 1985 was estimated at over 650 plants. The terrain was sandy clay and associated species included *Hypericum humifusum* (Trailing St John's-wort), *Ornithopus perpusillus* (Bird's-foot), *Potentilla*

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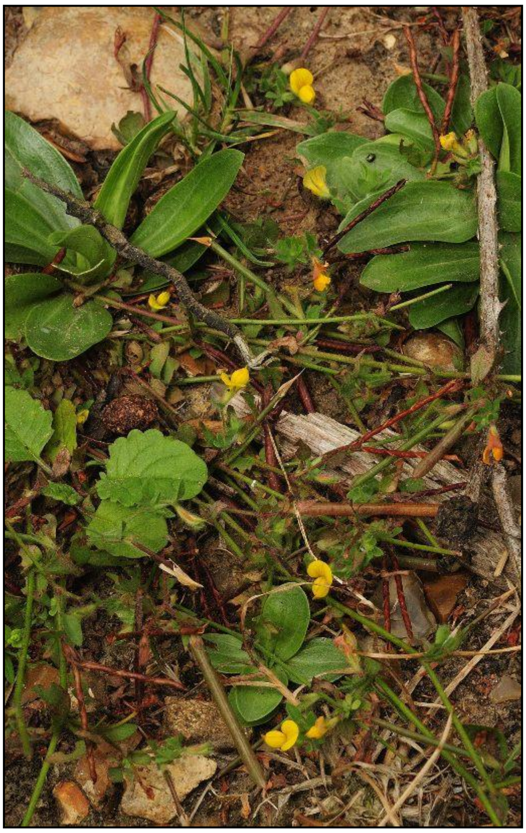
[381] B.D. Jackson (1875). Lotus angustissimus *Linn.*, in Kent. *Journal of Botany* N.S. **4**: 335-6 (not p.280, as given in Hanbury & Marshall, 1899).

[382] Rose, F. (1960). Botanical Records for Kent, 1955-58 – Vascular plants. *Transactions of the Kent Field Club* **1(2):** 56-65.

argentea (Hoary Cinquefoil) and *Spergularia rubra* (Sand Spurrey). Most *Lotus angustissimus* plants were found on a cinder track on the north side (inferred as at TR 2030 5904) and near the edge of woodland on the west, with a scattering elsewhere. A record was made by Eric Philp in 1989, but the plant could not be re-found for the purposes of the 1991-2005 county survey (Philp, 2010), despite repeated visits to the various East Kent localities. Nor was it found in August 2016, when there were no areas of bare ground suitable for germination. In August 2023, however, Steve Coates found three plants in spite of the invasion of tree and grass cover and the loss of the earlier interesting associated flora.

The most widespread population appears to have been that at Trenleypark Woods, found by Miss E. Day, c.1960. This is not far from the Littlebourne site and finds have been scattered over a fairly wide area of chestnut coppice on Thanet Sands. Its rediscovery here by Mrs H. Ayers led to a visit by Rosemary Fitzgerald and Andrew Henderson in October 1987 when plants were found at TR 193 598½ (>20 plants; TR 1932 5986 inferred from map; TR195598½ (>10 plants); TR 196 596 (five plants; TR 1961 5959 inferred from map); and TR197 595½ (>500 plants on 55 yards of path). Associated species included *Hypericum humifusum* (Trailing St John's-wort), *Hypericum pulchrum* (Slender St John's-wort), *Filago germanica* (Common Cudweed, *Ornithopus perpusillus* (Bird's-foot) and *Rumex acetosella* (Sheep's Sorrel). After then, there was a long absence of record and, although seen by Joyce Pitt in 2005, it was placed on the county 'probably extinct' list (scope for re-finding) in 2013.



Trenleypark Wood. Photo by Lliam Rooney, 11 August 2016

A KBRG meeting was planned for August 2016 to re-find the species in Trenleypark Woods, which was successful. Hundreds and possibly thousands of plants were found in fruit and flower on bare sand and gravel and lining both sides of a path (Stour Valley Walk) from TR 19105 59832 westwards to TR 19205 59844 (c. 100m)[383]. The path ran through sweet chestnut coppice cut in winter 2014/15, and its margins were rabbit-grazed. There were outlier plants: a patch of eight seen at a gateway 30m east of the main population at TR 19072 59824; and a solitary plant seen at a third site on a different path at TR 19560 59683. The prostrate matted growth of the nibbled path-side plants made counting individuals quite impossible. The associated flora was very similar to that recorded in 1985 – species of rides and path-sides in acid, somewhat sandy woodland, where exposed to light. It is likely that, although populations of *L. angustissimus* are known elsewhere to undergo dramatic fluctuations, possibly weather-related, a major factor at this site is the coppicing cycle. A persistent seed-bank probably enables continuation through unfavourable phases in the coppicing cycle, although it may be that rabbit disturbance also assists the occasional plant to reproduce when other areas are shaded out.

When the location was revisited by Sue Buckingham in August 2023, it was found to comprise tall coppice, dark and unsuitable. But approximately half a kilometre away, at TR 19572 59522, about 50 plants were flowering alongside a narrow but well-lit sand and gravel path through 3-4 year-old coppice on the south side of Stodmarsh Road. Another 350m further on, at TR 19544 59169, there were several hundred more flowering and fruiting together with evidence that thousands had flowered there earlier that year, perhaps May, presumably an autumn-germinatiing cohort that had survived the previous winter's cold. So it is apparent that the species is widespread over Trenleypark Wood and that the Littlebourne site can be regarded as associated, being only 760m from the last (in spite of remarks in *Plant Atlas 2020* about potential for SE England sand- or gravel-working sites being perhaps the subject of accidental introductions).

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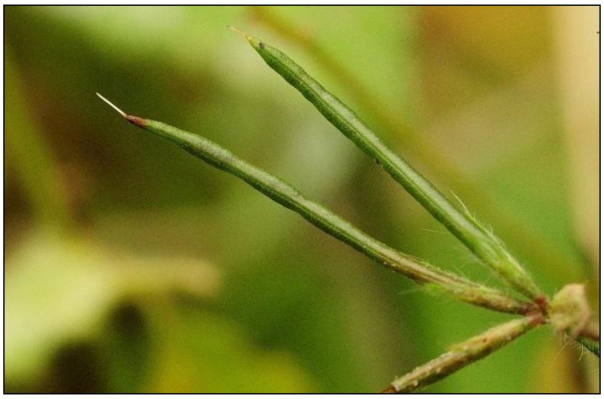
[383] It was still present in August 2018, when a record was made of its being frequent along a track at TR 1917 5983, for some 30m.

Trenleypark Wood, showing as dark ground colour the plants that had gone over earlier in the year. Photo by Sue Buckingham, 7 August 2023

Lotus angustissimus is generally regarded as an annual, germinating in autumn to flower next summer, if it survives (and it seems a delicate plant to over-winter, although summer drought on a harsh-draining substrate may be deleterious in any event[384]), or germinating in spring to flower from August onwards[385]. The abundance in 2016 may have been due to light exposure (with the opening up of coppice) triggering autumn germination followed by an exceptionally mild winter; then a damp spring enabling survival and growth, with perhaps a second flush of germination. Abundant autumn growth of new plants was noted at the October 1987 sighting[386].

The habitat requirements for the species appear to involve a certain amount of winter damp, but a well-drained soil in summer, with enough vegetation to provide support for the straggling growth, although not such as to out-compete it. Some bare ground would also be required for germination, but very bare, sharp-draining ground may result in stunted growth, as reported by FitzGerald (1988)[387], in drawing attention to larger plants at Trenleypark Wood being sheltered by *Agrostis capillaris* (Common Bent) and *Holcus lanatus* (Yorkshire-fog) fringing the edge of forestry tracks. This was also observed by Sue Buckingham in relation to the 2016 sighting, where the exposed plants mostly had ripe fruit and few flowers remaining whilst those few plants seen in slightly denser growth with *Holcus lanatus* were at an earlier stage of flowering and fruiting and tended to have a more upright growth form. This suggests environmental impact, although summer/autumn germination effects may also be relevant.



Trenleypark Wood. Photo by Lliam Rooney, 11 August 2016

Lotus angustissimus could be confused with *Lotus subbiflorus* (Hairy Bird's-foot-trefoil), although the latter is not present in Kent. They differ in that the latter is hairier, with 2-4 flowers per head (1-2(3) for *L. angustissimus*) and smaller fruits. Otherwise, a species which might need distinguishing, if stunted, (and which is present at Trenleypark Wood) is *Lotus pedunculatus* (Greater Bird's-foot-trefoil). However, the small flowers (5-6mm) of *L. angustissimus*, occurring singly or in pairs, their shape and colouring and the long slender legumes (up to 30 x 1-1.5mm) containing abundant seed (around 26 in a pod) distinguish *L. angustissimus* clearly.

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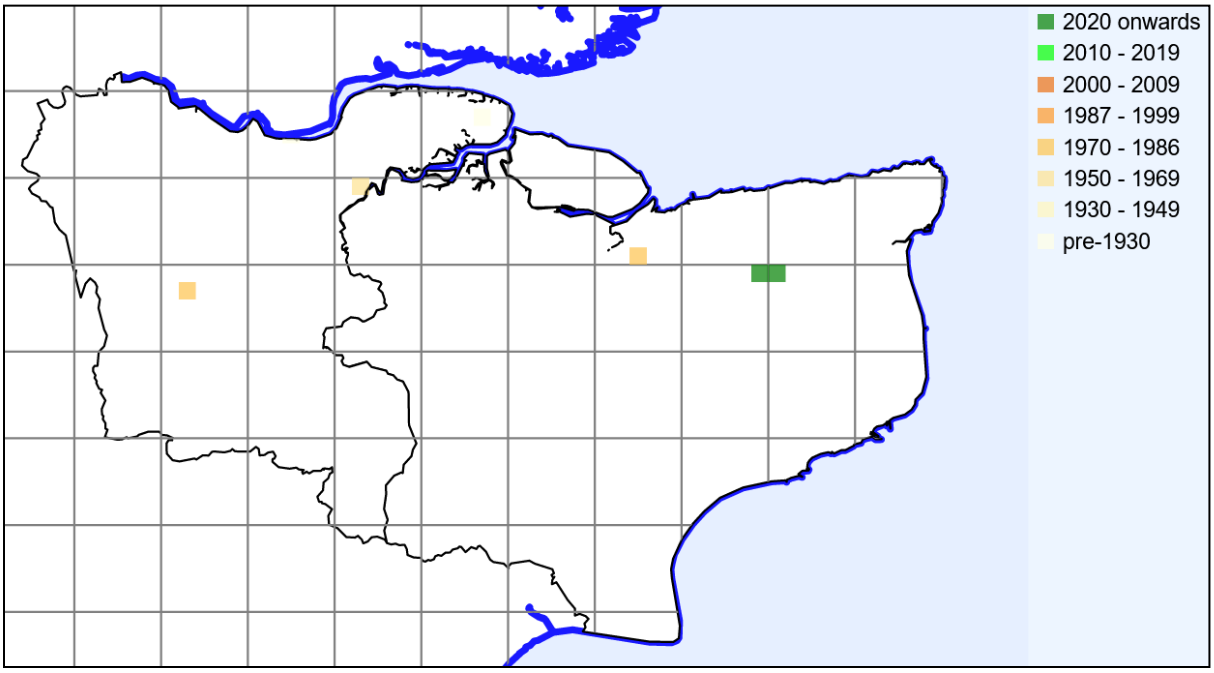
[384] The effect of summer drought is equivocal, and it has been noted generally that the largest numbers of plants often occur in the two summers following a bad drought year (Leach, S.J., *Lotus angustissimus* L. (Fabaceae) in, ed. Wigginton, M.J. (1999) *British Red Data Books 1 Vascular Plants*, JNCC, Peterborough). The Kent 2023 observations followed the excessively hot dry summer of 2022.

[385] Leach, S.J. (1999) *Lotus angustissimus* L. (Fabaceae), in (ed.) Wiggington, M.J. *British Red Data Books 1 Vascular Plants*. JNCC, Peterborough.

[386] FitzGerald, R. (1988). *Lotus angustissimus* L. Slender Birds-foot Trefoil. Unpublished NCC report.

[387] *Vide supra*.

Lotus angustissimus **Kent records to 2024 mapped at tetrad level, from BSBI database.**



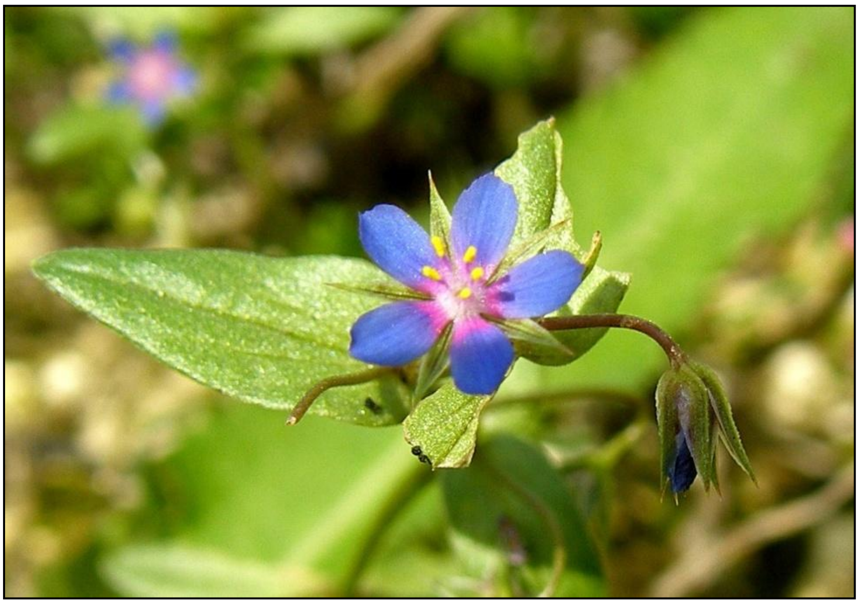
This account has benefited greatly from the assistance of Sue Buckingham.

Lysimachia foemina (Mill.) U. Manns & Anderb. (=*Anagallis arvensis* subsp. *foemina* (Mill.) Schinz & Thell.) (Blue Pimpernel)

vc 15 and 16

Rarity / scarcity status

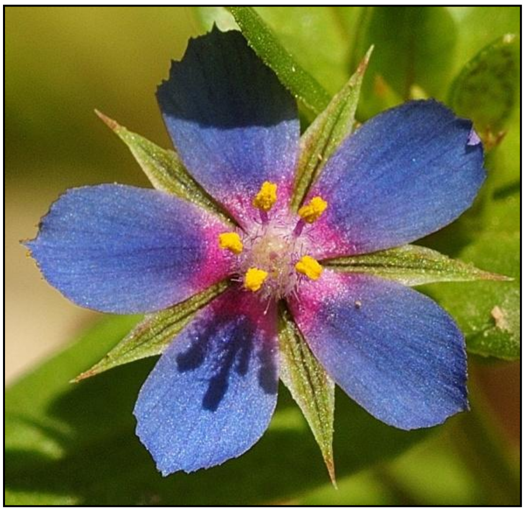
Lysimachia foemina is not regarded being particularly at risk over Great Britain as a whole (being treated as of 'Least Concern'), although **nationally scarce**. In Kent it is **rare**, with only one current site.



Ranscombe Farm. Photo by Lorna Holland, 9 September 2006

Account

John Gerard in his 1597 *Herball* referred to finding *Lysimachia foemina* "with blewe flowers in a chalkie corne fielde in the way from master William Swaines house of Southfleete to Long fielde downes, but never any where else". This constitutes the first Kent record if referring to the true Blue Pimpernel, which has long been confused with the blue form of *L. arvensis* (Scarlet Pimpernel). The true plant substantially lacks hairs on the corolla-lobe fringes and where present, they are 4-celled, rather than 3-celled.



Ranscombe Farm. Photos by Lliam Rooney, 24 July 2012.

Cornfields account for many of the records cited by Hanbury & Marshall (1899), who regarded the plant then as rather scarce. It is an introduced archaeophyte, as with many other arable weeds, and there is some evidence of decline in Kent in recent years. Philp (1982) gives it in eight tetrads[388], particularly in arable fields on chalk in the Hartley/Fawkham area and east of the Medway between Cobham and Upper Halling. By contrast, the only two records in Philp (2010) are off the chalk – open fields near Rolvenden (TQ8233, south west of Cott Farm) and from Pluckley (TQ94G).

The Cobham / Upper Halling area includes Ranscombe Farm which has a long history of occurrences. According to Hanbury & Marshall (1899) a specimen from a cornfield between Cobham and Cuxton was in the herbarium of John Stuart Mill (1806-1873). There appear to be gaps in its appearances, which traditionally have been along the northern boundary of Kitchen Field, where this chalky arable field slopes up to the edge of Lodge Wood in Cobham Park. Records on 9 and 15 September 2006 at TQ6968 (comm. Lorna Holland and Brian Woodhams) did not seem to be followed by others until 2012, when hundreds (if not thousands) of plants were seen by many observers from early July onwards. This population surge apparently follows a change from ploughing in autumn to spring, so the cultivation regime is evidently important for this species. It was, however, not repeated to the same degree in 2013, although still present at Kitchen Field according to Richard Moyse, who also then found it at TQ 698 675 on the margin of Brockles Field, which had received some light spring cultivation. It was also present in 2014, when about six plants were reported by David Steere as seen In the centre of the rutted path which crosses Kitchen Field, TQ 698 680, about 100-200 yards away from the tradition location at the field's northern boundary. Fewer than ten plants were seen by Richard Moyse in 2016; more than ten in 2020, at TQ 69 7680, where it flowered from July into early September.

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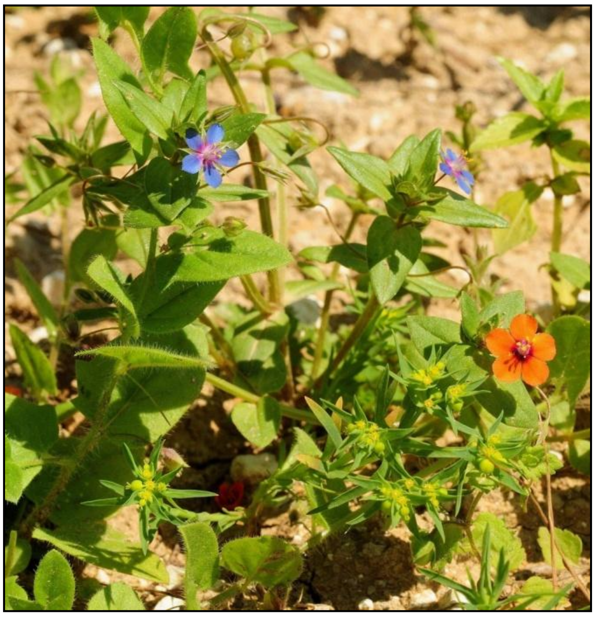
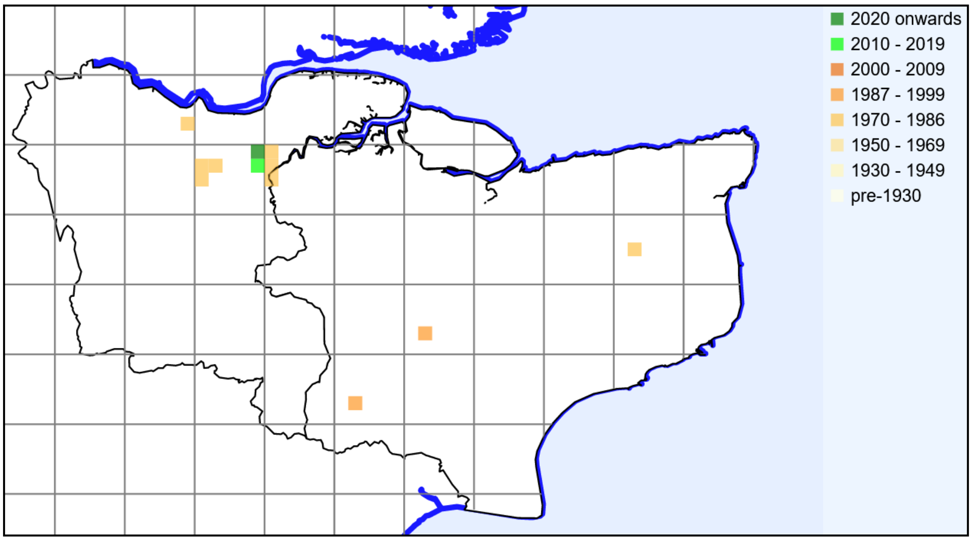
[388] These are: TQ57R (chalk field alongside Darenth Wood, 1976), TQ56X, Y and TQ66D (Fawkham / Hartley), TQ66X, Y, Z (Ranscombe Farm area) and TR25C (between Adisham and Bekesbourne).



Ranscombe Farm. Photos by Lliam Rooney, 24 July 2012. Above: growing with *Lysimachia arvensis* (the usual scarlet colour form) and *Euphorbia exigua* (Dwarf Spurge). Right: habitat.



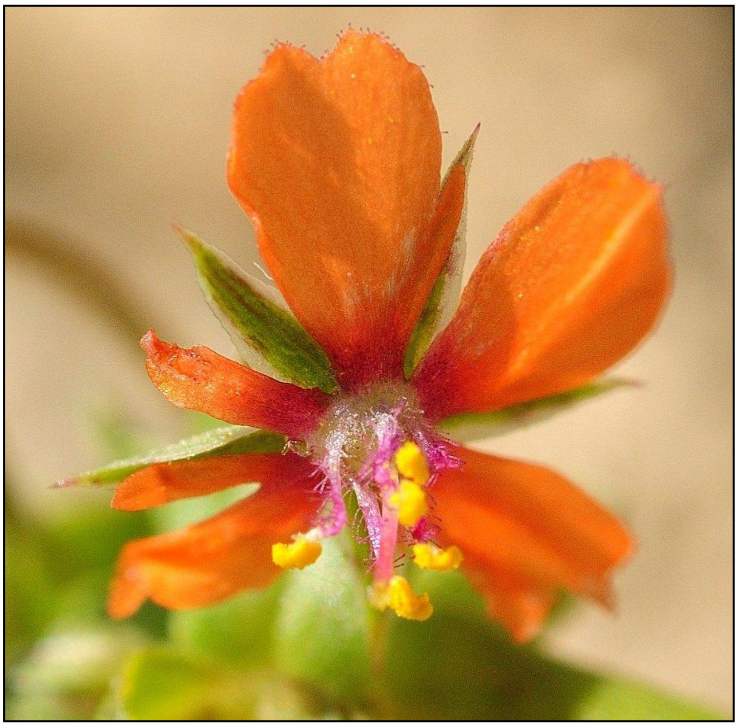
***Lysimachia foemina* Kent records to 2024 mapped at tetrad level, from BSBI database.**

L. foemina has been known to hybridise with *L. arvensis* (*Lysimachia* x *doerfleri*), albeit until 2024 with only one British occurrence, in an arable field in Warwickshire, 1950). However, in July 2024, it was detected at Kitchen

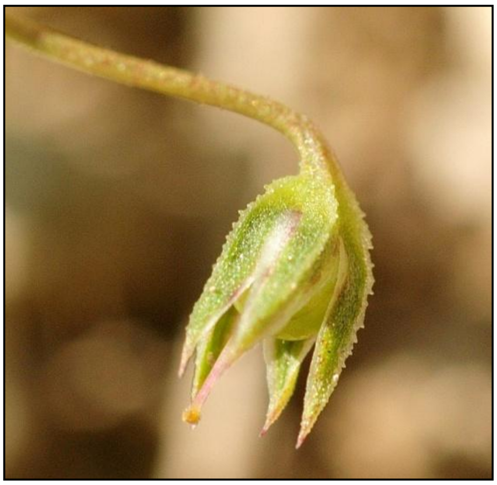
Field Ranscombe in the course of surveying by Lliam Rooney and Lesley Mason – an account of this discovery is given in Kent Botany 2024.

The survey recognised the presence of *L. foemina* along a 42 metre length of the north-eastern boundary of the field, at TQ 69814 68079, TQ 69811 68078, TQ 69789 68103 and TQ 69818 68073. *L. arvensis* was also present. A scarlet-flowered plant was found with gaps between the petals so that the sepals showed between. This is normally a characteristic of *L. foemina*, not *L. arvensis.* It alaso appeared to show intermediacy in length and distribution of the minute glandular hairs on the fringes of the petals - in *L. arvensis* they are frequent and short (three-celled); in *L. foemina* they are relatively infrequent and slightly longer (four-celled).

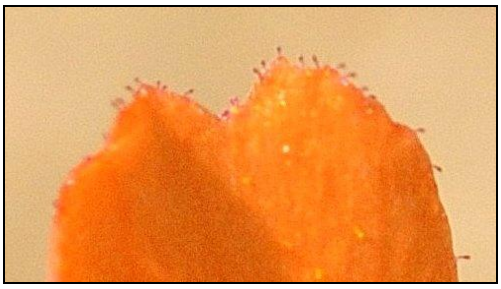
On 5 August, Lliam Rooney collected material from a further scarlet-flowered plant with non-contiguous petals, found in the vicinity of the previous find, c. TQ 69812 68075. It had undeveloped fruits, in contrast with other plants in the neighbourhood, suggesting the hybrid sterility possessed by *L.* x *doerfleri*. From this second plant he took photos of the flower (which was not in ideal condition but adequate for study) and an undeveloped fruit (both given here). He collected the flower for microscopic examination which supported earlier observations on the diagnostic corolla lobe hairs, with a photograph showing the presence of at least one four-celled glandular hair, a feature which can only be attributable to genetic contribution from *L. foemina*.



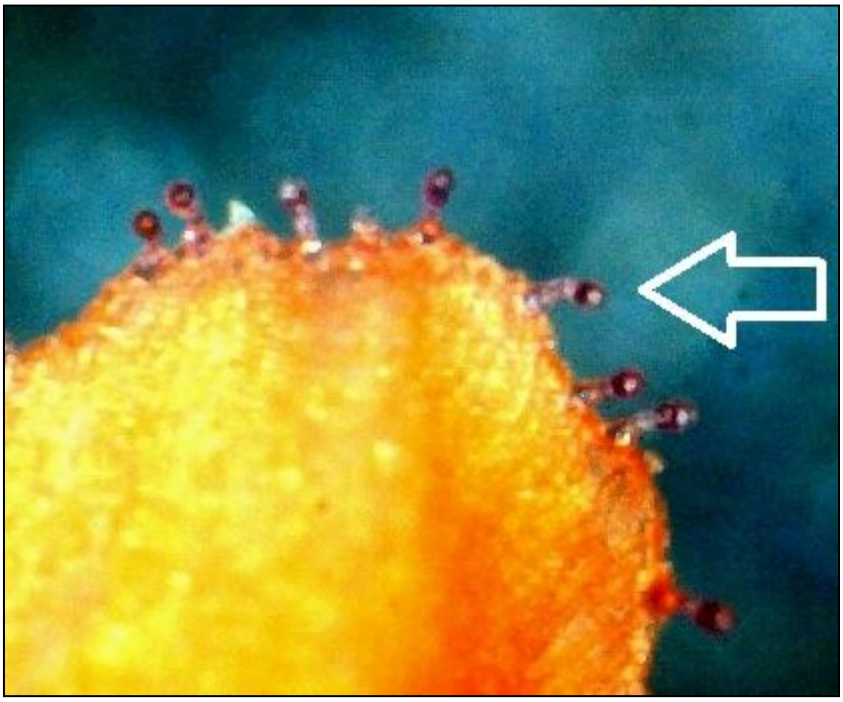
Lysimachia x doerfleri, **flower with non-contiguous petals, August 2024**



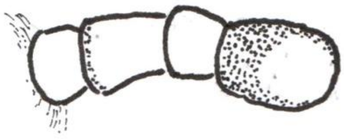
Lysimachia x doerfleri, **undeveloped fruit, August 2024**



Lysimachia x doerfleri, **distribution of hairs on corolla lobe margin, August 2024**



***Lysimachia x doerfleri*, glandular hairs, August 2024, with interpretive drawing to show four cells including apical gland**



Lysimachia minima (L.) U. Manns & Anderb. (=*Centunculus minimus* L. or *Anagallis minima* (L.) E.H.L. Krause) (Chaffweed)

vc 15 and 16

Rarity / scarcity status

Chaffweed's main distribution in the British Isles is in the south, west and north west of Britain, and western Ireland. This distribution appears to be fairly stable except in England, where losses, perhaps associated with changes in heathland management, have taken place; the possibility that these losses may be accelerating has resulted in the species being regarded as **Near Threatened** in Great Britain as a whole and **Endangered** in England. There is little in eastern England; the Weald is an exception. In Kent it is not a common plant, but the extent of its occurrence is such that there is no special designation of rarity or scarcity. It is a Kent axiophyte and so is an indicator of good habitat.

Account

The first possible evidence of the presence of Chaffweed in Kent is the tentative identification of its fruit within a peat deposit dating from 1700 BC to 200 AD in a sewer trench outside Wingham[389]. The first published record for Kent (and for Britain), however, was given as an addendum to the 1724 edition of John Ray's *Synopsis Methodica Stirpium Britannicarum* (edited by Dillenius), as present in a dale just before Chislehurst Common. Hanbury & Marshall (1899) only gave it as mostly historic records for Chislehurst, Tunbridge Wells, Hothfield, Brabourne, Willesborough Lees and Sandling Park, remarking that it was rare, but was probably less so than it seems, being very inconspicuous. This is an understandable assessment. Chaffweed is a very small plant, difficult to see other than at ground level. It is most probable that it had been overlooked and was significantly more widespread than this, particularly in woodland rides in the Weald. This potential for overlooking is also illustrated by the differences between the surveys in Philp (1982) and (2010). The 1971-80 survey accounted for eight tetrads in the administrative county. However, the 1991-2005 survey accounted for 21. The increase does not represent any population expansion, but reflects a targeting of this species in its favoured habitats. A particular concentration was revealed in Wealden hectads TQ73 and TQ83 (Bedgebury / Cranbrook / Hemsted Forest), with 14 tetrad records in those squares.

Hemsted Forest. Photos by Lliam Rooney, 25 July 2013

Our 2010-2024 records cover 23 tetrads (27 monads) and so ostensibly maintain overall site numbers. However, we have not found recently the same density of occurrences in the Bedgebury and Hemsted Forest areas, where the species was targeted in 1991-2005. Instead, we are recording outliers in areas when not seen before (especially in TR14 and TR15, the Downs dip slope between Elham and Canterbury), so it is possible that the success of the targeted 1991-2005 survey has deflected attention from locations which were not targeted, but where this inconspicuous annual may yet be present.

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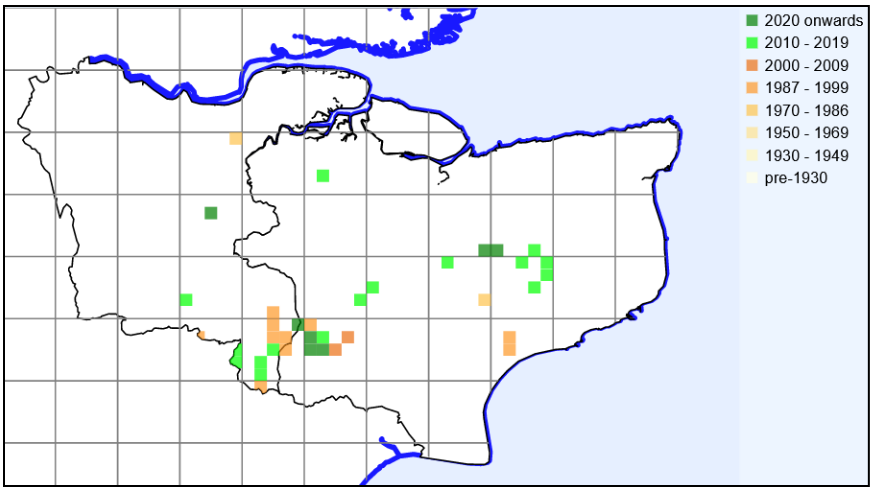
[389] H. Godwin (1962). Vegetational History of the Chalk Downs as seen at Wingham and Frogholt. *Veröffentlichungen des Geobotanischen Institutes der Eidg. Tech.*, Hochschule, Stiftung Rübel, in Zürich **37**: 83-99.



***Lysimachia minima* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Lysimachia minima is an annual of open areas such as forest rides and path sides, generally on acid soils, sand or Weald Clay. It relies on disturbance to maintain bare soil for establishment and in order to avoid competition which would otherwise overwhelm so small a plant. Seeds generally germinate in the spring, but there are occasional autumn-germinated plants which are comparatively large and obviously account for much greater seed production per plant.

Jim Bevan described[390] finding this species with Eric Philp, initially using the presence of *Linum radiola* (Allseed) as a prompt, as the two grow in association. Other associated species were *Aphanes arvensis* (Parsley-piert), *Gnaphalium uliginosum* (Marsh Cudweed), *Hypericum humifusum* (Trailing St. John's-wort) and *Juncus bufonius* (Toad Rush). The presence of *Centaurium pulchellum* (Lesser Centaury) may be indicative for Chaffweed, but in relation to nearby damper ground. Areas with *Scutullaria minor* (Lesser Skullcap) will be too damp; as also those with *Lythrum portula* (Water-purslane), which may resemble Chaffweed at a distance. Bevan also refers to its discovery in woodland on chalk, in TR04J (perhaps somewhat surprisingly, although this habitat has also been reported from Dorset, and is likely to be applicable to several of the records given in the table below; also, E.J. Salisbury secured 45.6% seed germination on John Innes compost with chalk[391]). A chalk locality was also recorded by Francis Rose in 1986, above a chalk pit near Brook, Wye.

Hemsted Forest. Photo by Lliam Rooney, 25 July 2013

Our 2010-24 records give associated species:

- at various Hemsted Forest locations - (1) *Agrostis stolonifera* (Creeping Bent), *Lysimachia nemorum* (Yellow Pimpernel), *Lythrum portula* (Water-purslane), *Ranunculus flammula* (Lesser Spearwort); (2) *Juncus bulbosus* (Bulbous Rush), *Lythrum portula*; (3) *Gnaphalium uliginosum* (Marsh Cudweed), *Juncus bufonius* (Toad Rush); (4) *Linum radiola* (Allseed)
- at Dering Wood - *Calluna vulgaris* (Heather), *Polygala serpyllifolia* (Heath Milkwort), *Pteridium aquilinum* (Bracken), *Ranunculus flammula*
- at Pembury Walks - *Linum radiola*, *Plantago major* (Greater Plantain), *Potentilla erecta* (Tormentil), *Prunella vulgaris* (Selfheal),

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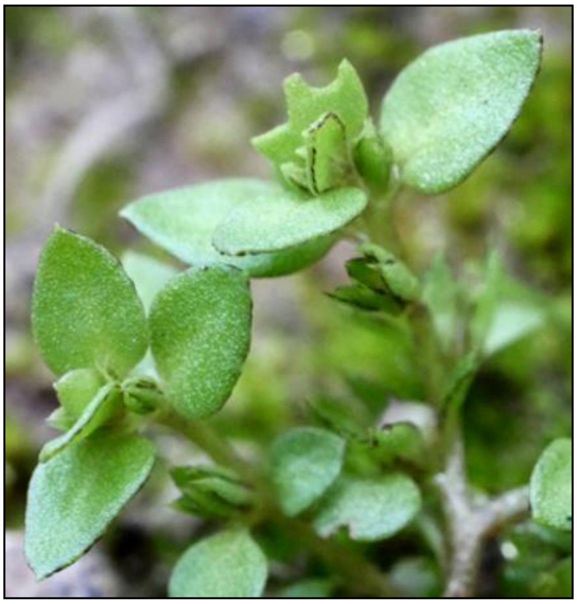
[390] J. Bevan (1999). *Anagallis minima* in Kent. *BSBI News* 81: 19-21.

[391] E.J. Salisbury (1969). The reproductive biology and occasional seasonal diomorphism of *Anagallis minima* and *Lythrum hyssopifolia*. *Watsonia* **7**: 25-39.

- at Upper Hardres Wood - *Gnaphalium uliginosum*, *Hypericum humifusum* (Trailing St John's-wort), *Lythrum portula.*
- at Boughton Aluph - *Hypericum humifusum*, *Isolepis setacea* (Bristle Club-rush), *Juncus bufonius.*

All are characteristic of damp woodland rides, generally acid, and they include a number of rare plant register species and Kent axiophytes, so as to suggest habitat of good quality.

Identification difficulties with Chaffweed may arise from its small size and general anonymity. It has solitary flowers and alternate leaves, but particularly characteristic are the blackish glands bordering the lower edge of the leaves – see accompanying photo.



Sissinghurst. Photo by David Steere, 12 August 2021

Site	Grid reference	Site status	Last record date	Recorder	Comments
Knatts Valley	TQ5762		July 1985	JP	TQ 5721 6262.
Pembury Walks west	TQ6142	RSPB reserve	16 August 2014	SB	Frequent along a narrow, damp footpath at TQ 6189 4229.and for at least five metres in both directions. Associated plants: *Linum radiola, Prunella vulgaris, Ranunculus flammula, Plantago major* and *Potentilla erecta*.
Great Leybourne Wood, Offham	TQ6456		26 September 2021	DS	TQ 645 567 in recently coppiced woodland, black dots along leaf edges.
Chingley Wood	TQ6833		22 August 2019	SL, CAS, DTS	Chingley Wood, old hardcored track down to pond, TQ 687 338. One large fruiting plant.
South west of Kilndown	TQ6933		(1) 11 August 2018 (2) 13 August 2017	1) KBRG / KFC meeting (2) SL	(1) Chingley Wood, Damp margin of path at TQ 686 339. (2) Chingley Wood, T-junction of rides where ground recently re-landscaped, just south of stream, TQ 6912 3375.
South west of Kilndown	TQ6934	Part National Trust	(1) 13 July 2019 (2) 11 August 2018 (3) 13 August 2017	(1) JH & AH (2) KBRG / KFC meeting (3) SL	(1) TQ 69159 34703, woodland ride, Scotney Estate, Kilndown. (2) Chingley Wood. Quite scarce and very small this year due to prolonged summer drought. (3) Chingley Wood, open damp sandy track bordered to west by Sweet Chestnut coppice cut this Spring, TQ 691 340. A few plants.
Eccles	TQ7160		20 March 1991	JP, AWa & PBu	Eccles Old Pit, TQ 719 608.
Bedgebury	TQ7232	Access land managed by Forestry England	(1) 13 August 2023 (2) 17 August 2017	(1) SL (2) KBRG meeting	(1) (a) Bedgebury Forest, Starvegoose Bank, TQ 72431 32803. Along wide track. (b) Bedgebury Forest, TQ 72694 32339. Damp corner of track (2) On a damp ride with *Linum radiola*, scattered plants at TQ 7285 3281 to TQ 7280 3279 and elsewhere along same ride. In profusion on another ride at TQ 7270 3234 again with abundant *Linum radiola*.
Flimwell	TQ7243		25 July 2014	JVC & JAR	TQ 72138 30930, small patch 30 x 10 cm on damp woodland track; a

					few other plants seen in vicinity.
Bedgebury	TQ7332	Managed by Forestry England	17 August 2017	KBRG meeting	Scattered plants with *Linum radiola* on a damp ride from TQ 7316 3278 and continuing westwards along the same ride.
Bridge Woods, west of Rochester Airport	TQ7363		23 May 1984	FR & JP	TQ 7379 6339.
Angley Wood	TQ7535, TQ7636		(1) 12 August 2014 (2) 16 July 1995	(1) AG, JP & MT (2) JBe, EGP	(1) TQ 7584 3592, at least a dozen plants in woodland ride with *Linum radiola.* (2) TQ 761 363, edge of ride in Angley Wood, 10+ plants.
Wilden Wood, Staplehurst	TQ7541		3 October 1998	JBe	TQ 754 419, on damp north-south aligned ride in Wilden Wood.
Sissinghurst	TQ7938	SSSI	12 August 2021	KBRG meeting	On a damp path well-lit in chestnut coppice at TQ 7999 3848
Roundshill Wood, Sissinghurst	TQ8138	National Trust	21 May 1998	JP	TQ 810 382, later recorded at TQ 809 380.
Hemsted Forest	TQ8135	Access Land managed by Forestry England	(1) 29 July 2021 (2) 22 July 1995	(1) KBRG meeting (2) JBe, EGP	(1) On a damp track at TQ 81428 35227 with *Gnaphalium uliginosum* and *Juncus bufonius*. Also at TQ 8165 3556 with *Linum radiola.* (2) TQ 819 355, on a track east of Dockenden.
Hemsted Forest	TQ8136	Access Land managed by Forestry England	(1) 4 August 2021 (2) 29 July 2021 (2) 30 August 1998	(1) SB (2) KBRG meeting (2) JBe, EGP	(1) Damp path at TQ 8156 3612. (2) In good quantity with *Linum radiola* at TQ 81759 36055. (2) TQ 815 363, edge of track, Chittenden Wood
Hemsted Forest	TQ8137	Access Land managed by Forestry England	6 August 1995	JBe, EGP	TQ 818 370, damp edge of ride, Chittenden Wood.
Hemsted Forest	TQ8235	Access Land managed by Forestry England	(1) 16 September 2020 (2) 15 August 2019 (3) 30 August 1998	(1) SB & JL (2) SB (3) JBe, EGP	(1) With *Juncus bulbosus* and *Lythrum portula*, 5 plants at TQ 8215 35263 (2) Hemsted Forest, two well-grown plants at TQ 82180 35474, in the shelter of a small bank at the edge of a wide ride with a lot of bare clay as a result of recent forestry operations. Associated plants: *Gnaphalium uliginosum* and *Juncus bulbosus*. (3)(a) TQ 820 350, edge of track, Timber Wood. (b) TQ 821 350, middle of a track, Timber Wood.
Hemsted Forest	TQ8236	Access Land managed by Forestry England	(1) 25 July 2013 (2) 30 August 1998	(1) KBRG meeting (2) JBe, EGP	(1) 30 plants at TQ 82539 36047 on a bare, seasonally wet sandy path with *Lysimachia nemorum*, *Ranunculus flammula*, *Lythrum portula* and *Agrostis stolonifera*. Also, four plants on a sandy path at TQ 82531 36242. (2) TQ 820 362, edge of track, Causton Wood.
Dering Wood	TQ8943, TQ9044	Access Land managed by Woodland Trust	5 August 2014	KBRG meeting	A few scattered plants along a damp ride at TQ 89712 43740 with *Pteridium aquilinum*, *Calluna vulgaris* and *Polygala serpyllifolia.* Also a hundred or more plants scattered along the margins of a damp ride at TQ 90221 44094 and TQ 90225 44084 and continuing for several metres south westwards along the ride.
Boughton Aluph	TR0249	Access Land managed by Forestry	(1) 11 August 2017 (2) 1 August 1998	(1) SB (2) JBe, EGP	(1) 15 plants on damp path TR 0278 4989 with *Isolepis setacea*, *Juncus bufonius* and *Hypericum*

		England			*humifusum.* (2) TR 028 498, track by chestnut coppice, King's Wood.
Bilsington	TR0335		5 September 1998	JBe, EGP	TR 038 354, Priory Wood (canopy closed, coppice 50+ yrs old).
Eggringe Wood	TR0950	Access Land managed by Forestry England/ Woodland Trust	(1) 25 August 2024 (2) 28 July 2021	(1) & (2) SB	(1) Alongside a wet ride at TR 09242 50053 with masses of *Lythrum portula.* (2) A few plants at TR 09981 50642, on a heathy path with damp margins.
Eggringe Wood	TR1050	Access Land managed by Forestry England/ Woodland Trust	28 July 2021	SB	Patch of eight plants at TR 10010 50622 on a heathy path with wet margins
Denge Woods	TR1051	Access Land	25 May 1986	JP	TR 1015 5169.
Bigbury	TR1157		26 September 1989	JP	TR 111 575.
Lympne	TR1335		30 September 1995	JBe, EGP	TR 131 356, damp sandy ride in Lympne Folks' Wood, 10+ plants.
Saltwood	TR1336		30 July 1995	JBe, EGP	Kiln Wood, wet area recently planted up.
Upper Hardres Wood	TR1449		20 September 2016	SB	Upper Hardres Wood. Just 5 plants counted along a damp (fairly overgrown) ride from TR14456 49439 to TR14495 49525. Associated plants: *Hypericum humifusum, Lythrum portula* and *Gnaphalium uliginosum*.
Atchester Wood	TR1548		25 July 2023	SB	Hundreds of plants scattered for 100 metres of damp track in Achester Wood from TR 1577 4813 to TR 1587 4812. More plants on adjoining path TR 1553 4836.
Elhampark Wood	TR1645	Access Land	6 September 2014	AG	TR 1624 4584, fifteen plants growing in damp, disturbed areas on edge of forest track, and TR 1643 4584, one plant in damp open ground in forest.
Bishopsbourne	TR1651		14 September 2016	SB	Gorsley Wood. Groups of plants on damp grassy paths at TR 1666 5177 and at TR 1695 5198.
Bishopsbourne	TR1751		14 September 2016	SB	Gorsley Wood. Plants scattered from TR 1719 5186 south to TR 1713 5172 on a ride in damp ruts made by chestnut coppice vehicles. More plants on side track at TR 1723 51829.
Covert Wood	TR1847	Access Land	1 September 2016	SB	Covert Wood, just a few plants in a couple of damp hollows along a wide ride at TR18391 47888 and at TR1819 4789
Covert Wood	TR1848	Access Land	(1) 5 August 2017 (2) 12 August 2014	(1) AG & LR (2) AG	(1) Covert Wood, edge of sparsely vegetated ride on slope, TR 184 481. A few tiny plants. (2) TR 1844 4824, eight plants, and TR 1820 4809, at least twenty plants. A complete search of the rides was not carried out and it seemed likely that more was present.

Lysimachia tenella L. (=*Anagallis tenella* (L.) L.) (Bog Pimpernel)

vc 15; probably lost from vc 16

Rarity / scarcity status:

Due to the relative frequency of boggy and marshy habitats in other parts of Great Britain, especially in the west, *Lysimachia tenella* is not subject to threat generally (and so its status is treated as of "Least Concern"). However, the paucity of those habitats in Kent means that it qualifies to be locally **scarce**. Indeed, it has not been seen at all in West Kent for some time. It is a Kent axiophyte and so is an indicator of good habitat

Sandwich. Photos by Lliam Rooney, 8 June 2011

Account:

Lysimachia tenella was first published for Kent by Christopher Merrett in 1666, referring to it as in the meadows between Deptford and Lewisham. Damp heathy places continued long enough in Kent for Hanbury & Marshall (1899) to regard the species as rather common. Now, however, such habitats have been lost to such an extent that the Bog Pimpernel is reduced to a handful of locations.

This was already the case when, around 1960, Francis Rose wrote of it in his MS *Flora of Kent* as a plant of calcareous fens, base-rich flushes in valley bogs, always among short vegetation of the *Parvocaricetum* type; now rare and very local, and almost confimed to calcareous fens in eastern districts, to valley bogs on Folkestone sand in the non-tidal Stour basin and to Dungeness. He contrasted Hanbury and Marshall's 28 locations with the 12 current sites which he then knew. The latter appear to have been all with records in the 1940s or 50s and located at Worth Minnis; Northbourne; Hothfield; Gibbons Brook; Cuckoldscoomb; Stowting; Hawkenbury Bog [in vc14]; Dungeness Hoppen Pits; Dungeness south east of Hamilton Farm; The Lince, Etchinghill; Darnley Vale, Sandgate; and between Hacklinge and Ham Fen.

The shrinkage of the Hanbury and Marshall sites seems to have been accompanied by a loss of ecological amplitude as they described it as 'especially on heaths' (and included Chislehurst bog and Keston Common on their list). There is perhaps a parallel with the Netherlands, where the species has also retreated from a wider variety of habitats, with decline attributed mainly to draininge and eutrophication, but also to a reduction in those human activities which may contribute to maintaining suitable habitat.[392] Kent may have more affinity with the Netherlands than with western Britain where the species flourishes most in a milder, wetter climate; and being at the margin of its British range, the species may exhibit greater sensitivity to change. Losses in south and eastern Britain in recent years may (Plant Atlas 2020) reflect lack of resilience in the face of episodes of summer heat and drought.

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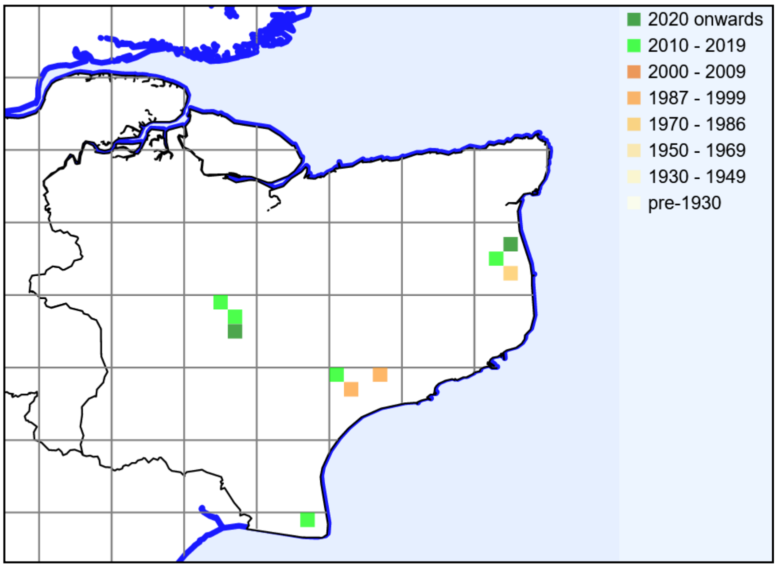
[392] Bruin, C.J.W. (1989). Over het voorkomen van Teer guichelheil [Anagallis tenella (L.) Murray] op Texel. *Gorteria* **15**: 44-57.

Philp (2010) treated the species as rare and decreasing through loss of habitat, the number of tetrad records having declined from five (in Philp, 1982) to four. This does not necessarily signify, as records for 2010-22 comprise seven tetrads (corresponding to eight monads), including where not previously known, e.g. Charing, by a small chalk stream.



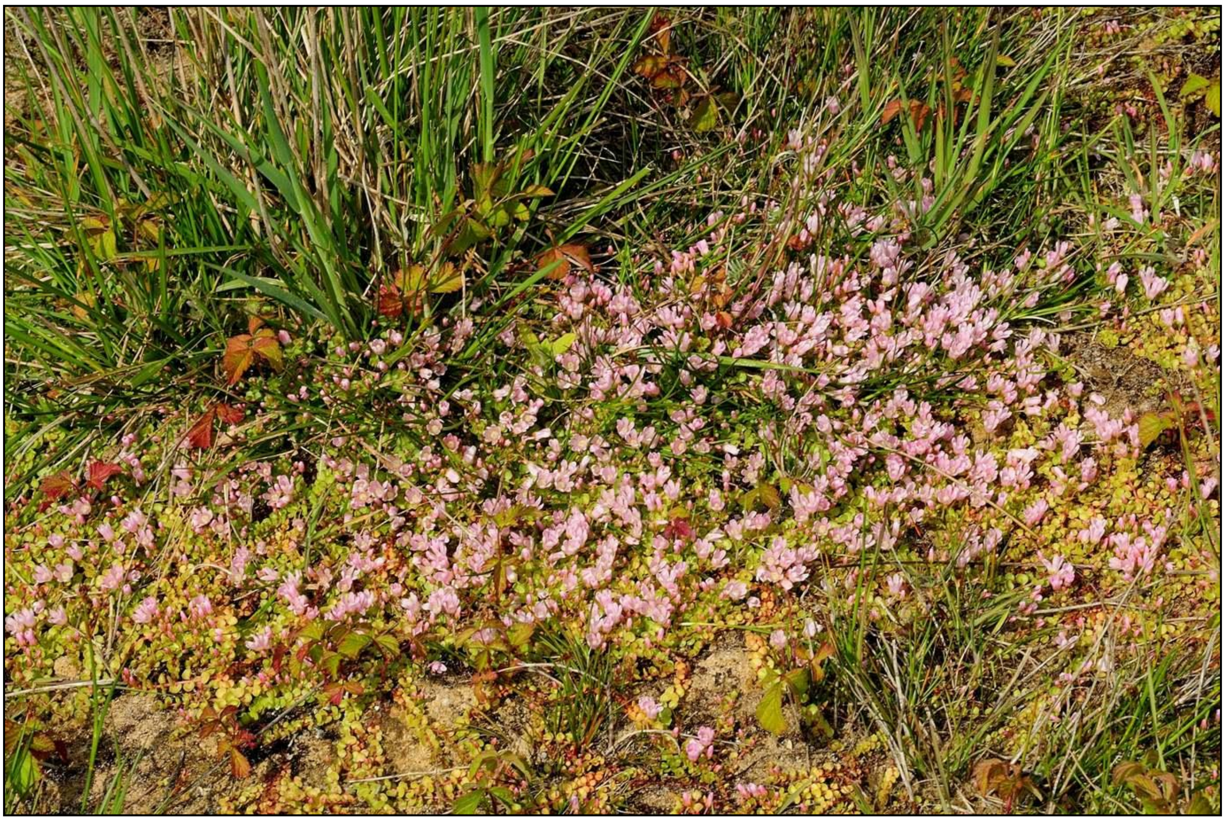
***Lysimachia tenella* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Lysimachia tenella favours wet open ground, and may be suppressed by rank growth or overshading – *Salix* / *Betula* clearance and pony grazing at Gibbin's Brook, for example, apparently restored this species to that site and it has been spreading (2013). Whilst it appears to grow in acid bog at Hothfield, this appears to be in a base-rich flush and elsewhere it grows in more obviously calcareous conditions. For example, at Etchinghill it has been found in marshes fed by chalk springs at the foot of the downs; at Charing it has been seen on the bank of a small chalk stream; and at Sandwich it flourishes in an apparently calcareous scrape in sand of the fixed dunes and appears to have spread thence as a pioneer to newly created habitat several hundred metres away.

Site	Grid reference	Site status	Last record date	Recorder	Comments
[Hawkenbury Bog]	[TQ5937]		[After 1970, before 1981]	[Philp, 1982](	Although given in Philp (1982), this site was in vc14 East Sussex, not West Kent vc16.
Snodland	TQ76B		10 July 1987	JP	Peaty field: two sites since lost to development.
Charing	TQ9449		3 July 2018	JL & LS	TQ 9470 4945 on the bank of a small chalk stream. Land to the south of the Swan Hotel.
Hothfield Bog	TR94S	SSSI, KWT managed reserve	(1) 23 June 2022 (2) 17 July 2016 (2) 30 June 2016 (3) 8 August 2015 (4) 5 July 2013 (5) 23 July 2012 (6) After 1990, before 2006 (7) 1997 (8) 1999/2000	(1) AL (2) DS (2) AW (3) BW (4) LR (5) SB (6) EGP (Philp, 2010) (7) JP (8) BB	(1) TQ 968 456. (2) TQ9645, main bog. (2) TQ970457. (3) TQ9645. (4) A small patch, 1 foot x 1.5 foot, at TQ 96716 46141. (5) A few small patches of plants by the board walk at TQ 96827 45655. (8) TQ 9682 4564, by boardwalk in Bog no. 2.
Dungeness	TR0618	SSSI, NNR, RSPB reserve	2002	BB	TR 066 183: one plant in dry area at edge of *Cladium* pit, where the species was recorded by FR in the 1950s. However, due to water levels, lack of grazing, *Phragmites* and *Salix* dominance, etc. the plant assemblage has fluctuated and it could not be re-found in 2003 or subsequently. The 2002 plant may have been from seed-bank or dragged out in *Salix* clearance, but died after starting to flower in a dry spell.

Cuckold's Coombe, Brook	TR 0744	SSSI	Late 1990s	BB	TR 0761 4444, an area cleared of willow and grazed by cattle, known previously for a range of fen plants. [Searched for, 2014, and not seen.]
Gibbin's Brook	TR1138	Access Land, SSSI	(1) 30 June 2013 (2) 17 July 2011 (3) 28 June 2010	(1) KBRG meeting (2) KFC meeting (3) AG	(1) In the area where one patch was found on 17 July 2011, now at least three well separated patches, one at TR 1159 3860 and the others in general vicinity. Also, the same patch as was recorded on 28 June 2010 at TR 116 384, when then about 10cm square. Now spread over an area of 5 x 3m. (2) TR 11590 38611, one patch. (3) TR 116 384: a tiny patch, c.10cm square, growing in an area of peat bog that looked as if it had recently been cleared of *Salix* scrub. It was growing in quite closely grazed and recently disturbed, bare, peaty ground with various *Juncus* species, *Potentilla erecta*, *Hydrocotyle vulgaris* and *Galium palustre*. Later in 2010, it was found to occur across 0.6 hectare, in open areas as well as those cleared (JN).
Westenhanger	TR 1336		After 1990, before 2006	EGP (Philp, 2010)	Pond in Kiln Wood, TR 132 364.
Etchinghill	TR1638		8 June 1997	JP	Meadow on gault clay.
Etchinghill	TR1739	SSSI, at least in part	After 1990, before 2006	EGP (Philp, 2010)	Marsh fed by chalk springs from coombe in chalk escarpment. There are specimens collected by FR from this area, including The Lince, from as far back as 1946, in MNE. Etchinghill sites searched 2011 by JP and AG without sightings.
Ham Fen meadow	TR3254		2005	JP	Present at least from 8 July 1997.
Ham Fen	TR3354	SSSI , KWT reserve	(1) 17 June 2018 (2) 13 July 2013 (3) 1 August 2012 (4) 5 August 2001	(1) SL (2) KFC meeting (3) SB (4) RM, BW	(1) (a) Hacklinge, west side of A258, cattle grazed pasture and ditches (Unit 56), northern end, TR 33864 54597. At least 4 small patches in a closely grazed area, growing with *Carex nigra, Carex flacca, Carex hirta, Carex distans, Cirsium palustre* and *Triglochin palustris*. Rest of this pasture seemed poorer quality (more dominated by grasses). (b) Hacklinge, west side of A258 (Ham Fen KWT), flooded ditch, cattle poached edge along both sides (Unit 53: Ham Fen Fields), TR 33846 54488 to TR 33765 442. (2) Small patch at TR 33427 54855 with another patch present beside *Carex lepidocarpa*, TR 3342 5490. (3) Frequent on wet peat at TR 333 548 and abundant at TR 3384 5449. (4) Present.
Ham Fen	TR3355	SSSI, KWT reserve	(1) 19 July 2017 (2) 26 August 2006	(1) SB & SL (2) RM, BW	(1) Frequent from TR 3305 5529 southwards to TR 3315 5512 within a wet peaty mire at Ham Fen.
Near Temptye	TR3456		1982	AH	
Sandwich	TR3557	Part in SSSI	(1) 19 June 2020 (2) 8 June 2011	(1) SB (2) LR	(1) A large patch of plants a few metres across appeared last year on the banks of an artificially created pool at TR 35823 57301. Presumably originating from the population a few hundred metres distant at TR 3578 5793 on Royal St Georges. (2) TR 35789 57932: six large patches (on average 0.6m x 0.3m), with numerous plants between, in a

					seasonally flooded dune slack, scraped out, roughly 6m x 5m, edged with *Iris pseudacorus* and *Carex distans*. Looks dry but water percolates up. Present at least since 8 September 2009 (JP).



Sandwich, habitat. Photo by Lliam Rooney, 8 June 2011

Lythrum hyssopifolia L. (Grass-poly)

vc 15; gone from vc 16

Rarity / scarcity status

Lythrum hyssopifolia is an archaeophyte, or ancient introduction, and is an extremely local plant of winter-flooded ground in southern England, otherwise a recently introduced plant, generally casual. It is considered an **Endangered** species in both England and Great Britain as a whole and is protected from picking or uprooting, under Schedule 8 of the Wildlife and Countryside Act 1981 as amended. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 62% in the likelihood of recording the species. In Kent, there are only two colonies of relatively recent standing, of which (despite the level of protection afforded to the species) one may have been destroyed *c.*2020 and the other is being destroyed on implementation of planning permission for development granted in May 2021. It is very **rare** and at risk of extinction in the county.

Betteshanger Country Park. Photo by Steve Coates, August 2011

Account

Fossil fragments were identified from clay subsoil at a Late Bronze Age hut site at Minnis Bay (Conolly, 1941)[393], but there is a possibility of contamination by modern material (Godwin, 1975)[394]. There has been no more than a handful of later Kent records, the first of which was 'In the Ditches near *Feversham Abbey* Pond', given by John Blackstone in his *Specimen Botanicum* (1746), but taken from a list by the Rev. John Bateman (which Edward Jacob says was produced about 70 years before publication of Jacob's *Plantae Favershamienses* in 1777). Syme (*English Botany*, vol. 3, 1865) said that he had a specimen from 'Near Rochester, Kent' – this may relate to a gathering by C. Conway in 1833, held in **BM**. Also, Hanbury & Marshall (1899) received a communication from J.G. Prebble as regards the presence of the species on the 'South Norwood side of the Irrigation Fields of the Croydon Local Board of Health, between South Norwood and Elmers End'. These were sewage works, with lagoons for (unsuccessful) drainage, and the site is now South Norwood Country Park, through which the vc16/17 boundary runs.

Betteshanger Country Park. Photo by Steve Coates, August 2011

There are also relatively modern records: by Cyril West, 1930, recorded as a casual at Teston; by H. Gray at West Malling, 1935; again by Cyril West, a single plant in a marshy area on the vc16 side of the River Medway near Aylesford in 1941, not seen the following year; by Ted Lousley, a casual at Barming, on 24 July 1966 (specimen in **BM**); and also a find by Miss L.M. Keens by a path through a barley field leading to Princes golf clubhouse at Sandwich in 1968[395]. None of these records points to any permanent presence, but most suggest that the River Medway, on both sides of Maidstone, provided a focus.

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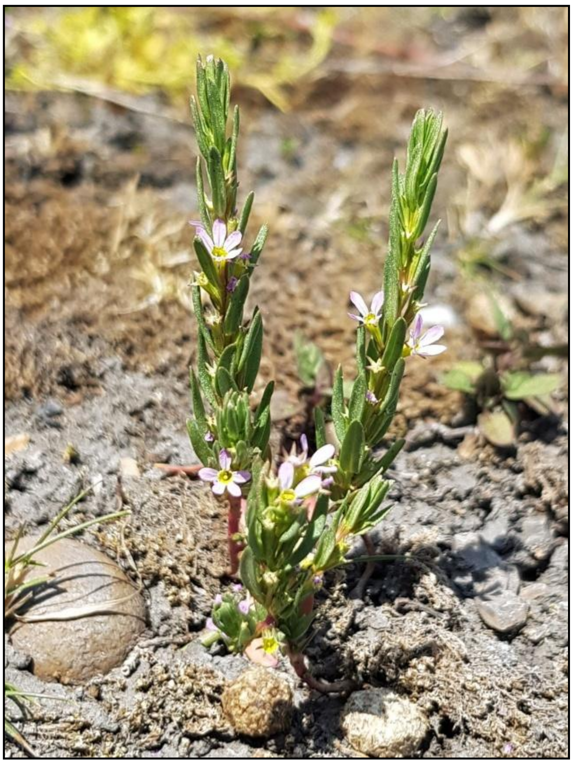
[393] Conolly, A.P. (1941). A report of plant remains from Minnis Bay, Kent, VII data for the study of post-glacial history. *New Phytologist* **40**: 299-303.

[394] Godwin, Sir H. (1975). *History of the British Flora,* 2nd edition. Cambridge University Press, Cambridge.

[395] Confirmed by Lady Anne Brewis, and mentioned in a letter from the finder to Francis Rose.

The only recent finds have been near Betteshanger. The first was at Betteshanger (formerly Fowlmead) Country Park. Here the species was initially seen by Joyce Pitt in 2010, but its identity was not confirmed. Subsequently, on 6 August 2011, Steve Coates found the same population, and it was possible to confirm it as *Lythrum hyssopifolia*. The colony was not in a classic winter-flooded field habitat, but in a ditch (TR 35287 54067) between the car park with its associated road system, and a children's play area. The plants were growing within an area of 165cm x 105 cm, containing mud and stones, beside an inlet pipe which brings water from the car park and consequently keeps this part free of larger vegetation. A count was made of 83 plants around 8 cm high, mostly with spent flowers, and about another 30 smaller ones in a congested clump, some of which were developing flowers. The site was submerged from time to time. Associated species included plants of a weedy nature and of wetland: *Agrostis stolonifera* (Creeping Bent), *Apium nodiflorum* (Fool's-water-cress), *Atriplex prostrata* (Spear-leaved Orache), *Epilobium hirsutum* (Great Willowherb), *Juncus articulatus* (Jointed Rush), *Persicaria maculosa* (Redshank), *Plantago major* (Greater Plantain), *Potentilla reptans* (Creeping Cinquefoil), *Pulicaria dysenterica* (Common Fleabane), *Rumex conglomeratus* (Clustered Dock) and *Tripleurospermum inodorum* (Scentless Mayweed).



The habitat is artificial, in the sense that it is the product of laying out for public access over a large area of shale derived from the former Betteshanger colliery. The origin of the plant here is not obvious, but may have been brought in by birds, especially in view of Continental proximity; or on Continental vehicles (British sites are rare and not necessarily vehicle-accessible); or as a seed contaminant. The last-mentioned origin for casual occurrences is suggested by a number of sources from Salisbury (1968)[396] onwards, but with little evidenced indication of what it may be supposed to be contaminating, although there is a USA report of its presence in clover and lucerne seed and the Canadian Food Inspection Agency records it as having been found once as a seed contaminant in the period 2001-2008. Stace (2010) refers to casual occurrences from birdseed, although the usual *Lythrum* from this source is *L. junceum* (False Grass-poly). The site was sealed off for works by Quinn Estates in 2019/20, is less open, and it is possible that the plants have gone.

Betteshanger Sustainable Parks, before development as Betteshanger Grove. Photo by Sue Buckingham, 2 June 2020

The second site is some 1.8km away, discovered by Sue Buckingham on 7 June 2020, at Betteshanger Sustainable Parks, a location for which planning permission for residential development (Betteshanger Grove) was subsequently granted, in May 2021, on application by Quinn Estates. The development was known to be incompatible with survival of the species, in spite of its protected status, and translocation was proposed, even though the species' habitat requirements are exacting, and in spite of the lack of evidence that translocation has been effectively achieved anywhere before. On discovery, at least 500 small plants were noted as spread over an area of 3m x 3m of bare colliery shale, TR 33770 53089, mostly in a depression made by vehicle tyres and in an area which had obviously been flooded during the previous (very wet) winter season, the location being particularly low-lying in its local context. A winter-wet habitat, drying out to permit germination, is required by Grass-poly and this seems to imply a fairly exacting habitat in relation to the colliery shale substrate which otherwise might be expected to drain more freely; it may be that a level of compaction is required. It is clear that 'the ecological requirements of *L. hyssopifolia* are specialised, and it relies for its continued occurrence on the flooding and disturbance of its sites' (Preston, 1999), although here it is likely that the barrenness of the habitat acts as proxy for disturbance in keeping the terrain open. Associated species at Betteshanger included *Epilobium tetragonum* (Square-stalked Willowherb), *Ranunculus parviflorus* (Small-flowered Buttercup) and *Trifolium ornithopodioides* (Bird's-foot clover).

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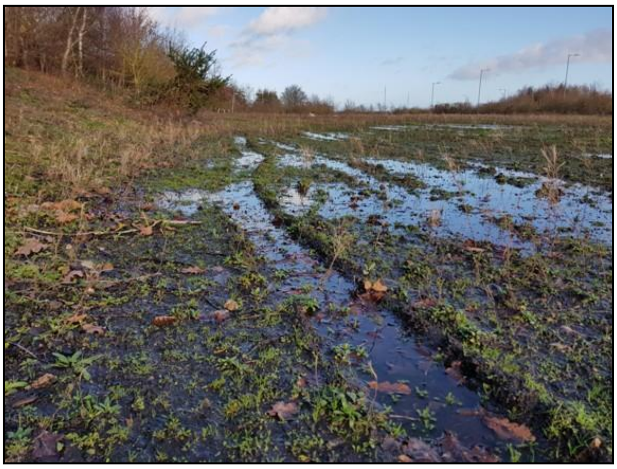
[396] Salisbury, E.J. (1968). The reproductive biology and occasional seasonal dimorphism of *Anagallis minima* and *Lythrum hyssopifolia*. *Watsonia* **7**: 25-39.



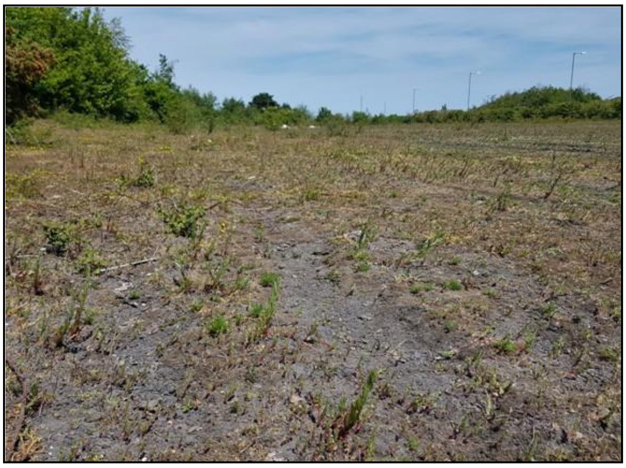


Photo by Sue Buckingham, 17 December 2020

Photo by Sue Buckingham, 2 June 2020

The Betteshanger proposed development site, showing winter-wet and summer-dry characteristics

Further survey in August 2021 by Aspect Ecology indicated a population of 500-1000 plants in two main areas (one, *c*. 1 x 3 m; the other, five metres to the south, *c*. 6 x 6m) totalling about 40 square metres. The topography was noted as flat / undulating with depressions which were recorded as holding up to 5cm water following heavy rainfall on the first day of survey, although dry on the next. Vegetation within these areas constituted predominantly low growing annuals on at least 50% cover of bare ground, with the substrate comprising fine sediment and small gravels and shales. Typical species were noted as *Bellis perennis*(Daisy), *Epilobium* spp. (willowherbs), *Hirschfeldia incana* (Hoary Mustard), *Jacobaea vulgaris* (Common Ragwort), *Matricaria/Tripleurospermum* spp. (mayweeds), *Plantago coronopus* (Buck's-horn Plantain), *Plantago major* (Greater Plantain), *Potentilla reptans* (Creeping Cinquefoil), and *Taraxacum* agg. (Dandelion). The more interesting species recorded in June 2020 were not listed, although the listing does not appear to be intended as (and is not) comprehensive.

The developer's translocation proposals[397] were for sites within areas of made ground formed by colliery spoil, and considered to support sparse vegetation, at (1) TR 3361 5280, immediately north of Colliers Way at the edge of woodland; (2) TR 3379 5292, an area of sparsely vegetated ground adjacent to a small attenuation pond within an intended central community park area; and (3) TR 3422 5329, within an area of sparsely vegetated ground at the edge of woodland. Two of these sites are in proximity to woodland, which contrasts with the species' original site and with what from its Cambridgeshire arable occurrences seems to be a need for open aspects. The resemblance of the sites to the habitat they are supposed to be replicating (which is intended to be destroyed after late August 2023), including as to winter flooding, might be thought to be limited, and their suitability will only be ascertainable after some years of monitoring and maintenance.

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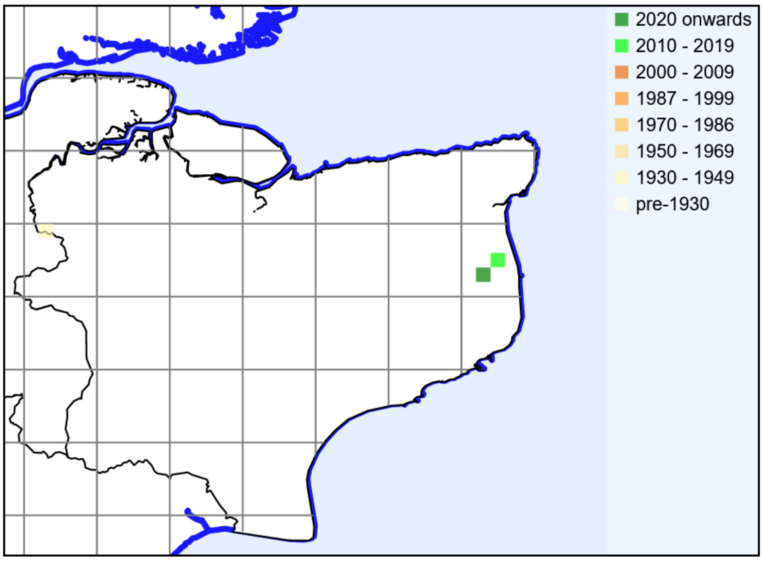
[397] *Grass-poly Translocation Strategy* (To Satisfy the Requirements of Condition 44 of Planning Permission 20/00419). January 2022. This is a publicly available and approved document published February 2022 on the planning portal of Dover District Council under CON/20/00419/A.

Reporting by the developer to the planning authority[398] covered the results of a survey on 16 June 2023:

- **Receptor site 1** (TR 3361 5280). 80 plants established in total: 12 in 'hollow 9' where sown in March 2023 and which held standing water at that time; 14 in 'hollow 14' where sown in November 2022 and which did not hold standing water in March 2023; 33 in 'hollow7' where sown in March 2023 and which held standing water then. All these except for 'hollow 14' were hollows which were deepened and lined in November/December 2022 because of inadequate water retention. *Filago germanica* (Common Cudweed), *Galium parisiense* (Wall Bedstraw) and *Fragaria vesca* (Wild Strawberry) noted as present; future management would require scrub control.
- **Receptor site 2** (TR 3379 5292). 111 plants established in total: 13 in 'hollow 11' where sown in March 2023 and which held standing water at the time; 14 in 'hollow 1' where sown in March 2023 and which held standing water at the time; 33 in 'hollow 4' where sown in March 2023 and which held standing water at the time; 37 in 'hollow 10' where sown in November 2022 and which held standing water in March 2023. 'Hollows 11 and 1' were deepened and lined in November/December 2022 because of inadequate water retention.
- **Receptor site 3** (TR 3422 5329). Only 29 plants were recorded as established in total: one in 'hollow 4' and 28 in 'hollow 5', both being deepened and lined hollows and sowing (at least for the former) having been in March 2023. Other sowings were failures. The site was more heavily encroached by scrub, herb and tall ruderal growth, than others, likely due to richer soils. Frequent vegetation management was recommended, but one could conclude already that this is not likely to be sustainable and the site was poorly chosen.
- Overall, the survey points to more effective establishment (year 1) as being along the margins of hollows excavated and deepened with water retentive lining. The timing of sowing (March or November) was not considered to make much difference.
- It was proposed that that the upper 5-10cm of substrate where Grass-poly was originally found would be scraped and deposited at Betteshanger Country Park (likely to be late August/early September 2023) at locations including the margins of the newlycreated pond and hollows/scrapes within areas of new open mosaic habitat created as part of the Biodiversity Offsetting Scheme under the S106 agreement for the residential development (sowing locations were to be marked on the ground with posts, with detailed GPS locations to assist with ongoing monitoring).

Monitoring was also supposed to be carried out in 2024, 2025 and 2026 (thereafter every two years until 2052). No report for 2024 monitoring was, however, placed on the planning portal (as at April 2025).



***Lythrum hyssopifolia* Kent records to 2023 mapped at tetrad level, from BSBI database.**

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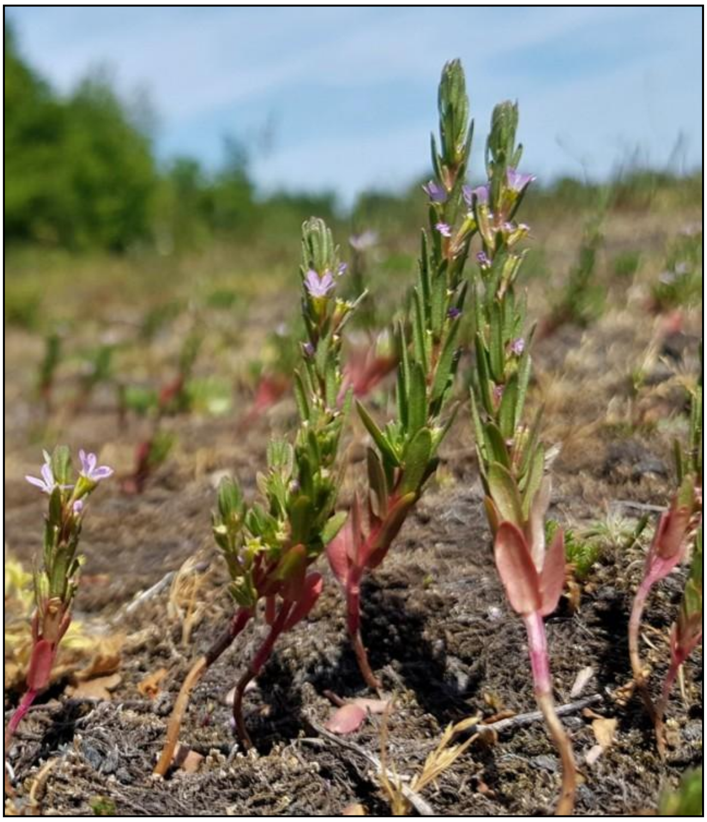
[398] *Grass-poly Monitoring Results* (July 2023), report by Aspect Ecology. This is a publicly available document published August 2023 on the planning portal of Dover District Council, under CON/20/00419/A.

Grass-poly is an annual with quite specialised ecological requirements, needing winter-wet disturbed ground, and germinating in spring when waters recede. Populations may vary from year to year depending on the suitability of conditions, but the long viability of the seeds provides a buffer against temporary environmental change[399].

Identification issues relate primarily to the occurrence also of False Grass-poly as an introduction in Britain: *L. hyssopifolia* and *L. junceum* may be separated by the former having pale pink flowers with (usually) 4-6 stamens and 2-3mm petals; *L. junceum* has purple flowers with 12 stamens and 5-6mm petals.



Betteshanger Grove. Photo by Sue Buckingham, 2 June 2020

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[399] Preston, C.D. *Lythrum hyssopifolia* L. (Lythraceae), in (ed.) Wiggington, M.J. (1999). *British Red Data Books 1 Vascular Plants*. J.N.C.C.

Kent Rare Plant Register
Species accounts Part M & N

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group

Issue date: May 2025

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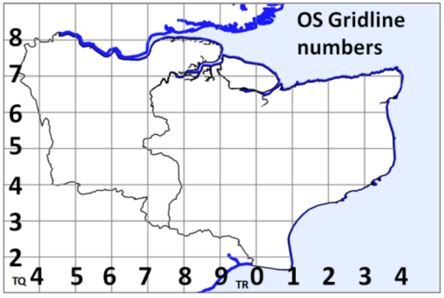
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at **tetrad** (2 x 2km squares) or **monad** (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

A&MT Andy & Maggy Tebbs
ACH Andrew Henderson
AL Alex Lockton
AW Tony Witts
BH B. Hadfield
BW Brian Woodhams
CD Chris Dyson
CEC Carter Ecological Consultants
CO Colin Osborne
CR Chris Rose
CW Cyril West
DC David Carder
DCh Danny Chesterman
DG Doug Grant
DG-S D. Groen-Stocker
DN David Nicolle
DS David Steere
EGP Eric Philp
FH F. Horsman
FR Francis Rose
GH Geoffrey Hall
GK Geoffrey Kitchener
HS H. Sargent
HSt Holly Stanworth
HW Hazel Williams
IB Ishpi Blatchley
JA Jan Armishaw
JBed John Bedford
JC Juliet Cairns
JD John Duffield
JES J.E. Smith
JL James Lindesay
JM J. Mobarak
JP Joyce Pitt
JRP John Palmer
JW Jo Weightman
KBRG Kent Botanical Recording Group
KFC Kent Field Club
KF-S Kate Fidzcuk-Sturry
KC K. Chandler
KO K. Obbard
LR Lliam Rooney
MA Martin Allison
MB Matthew Berry
MC Professor Mick Crawley
MF Michael Foley
ML Mel Lloyd
MP Mary Page
MR Mike Robinson
NS Nick Stewart
OD Owen Davis
PD Phyllis Davis
PG Peter Gay
PHa P. Hardy
PW Phil Williams
RH R Hanson
RL Richard Lansdown
RM Richard Moyse
RMB Rodney Burton
SA Sheila Anderson
SB Sue Buckingham
IB Ishpi Blatchley
JA Jan Armishaw
JD John Duffield
JM J. Mobarak
JP Joyce Pitt
MF Michael Foley
MP Mary Page
OD Owen Davis
OFC Orpington Field Club
PD Phyllis Davis
PG Peter Gay
PHa P. Hardy
PW Phil Williams
SB Sue Buckingham
SK Sarah Kitchener
SL Stephen Lemon
SLo Stephen Lofting
SP Sue Poyser
VB-H V. Benstead-Hume

Other abbreviations and references:

BM =Natural History Museum herbarium	Hanbury & Marshall (1899) refers to their *Flora of Kent*	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	KWT = Kent Wildlife Trust	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
CGE = Cambridge University herbarium	MNE = Maidstone Museum herbarium	SLBI = South London Botanical Institute herbarium

Malva setigera Schimp. & Spenn (=*Althaea hirsuta* L., Rough Mallow)

vc 16; gone from vc 15

Rarity / scarcity status

Malva setigera would not normally qualify for a rare plant register as it is neither native (according to current thinking) nor an archaeophyte (ancient introduction). It accordingly has no national conservation risk rating, although when it was considered likely to be native, it was rated as Endangered. It is, however, a plant listed with protection under Schedule 8 of the Wildlife and Countryside Act 1981. There have been many casual records in Great Britain, as distinct from the more persistent long-term populations in Somerset, Oxfordshire and Kent. As regards Kent, *Malva setigera* has been growing near Cobham, the Ranscombe Farm area, since first discovered in 1792, and this is also the generally accepted[400] first record for the British Isles. So the species is considered to merit special treatment here as a **Kent heritage plant**, and is **rare** in the county.

Account

The first published record for Kent (and, it is always said, for the British Isles) was by the youthful Rev. Jelinger Symons who, in his *Synopsis Plantarum* (1798) stated that the distinguished investigator ('clarissimus indagator') Jacob Rayer had found a station for plants of this species in a field near Cobham in Kent in 1792. Its subsequent presence there is well documented, for example in the *Proceedings of the Botanical Society of London* in 1838, where an account is given of a members' '*Botanical Excursion to Cobham and Cuxton, Kent'*, which is a plea for greater precision in identifying plant sites by use of compass directions. The then traditional site description for *Malva setigera* (and *Salvia pratensis*, Meadow Clary) was 'Near the junction of the three parishes of Cobham, Cuxton and Stroud', and these directions quite defeated five members on their first excursion. A second trip was required, by which the members were able to record that 'Entering the Park by the gate nearest to Cobham, we passed by the road near the Mausoleum to the large beech tree which forms the point of junction of the three parishes I have named, following this road to the border of the wood, we inclined to the right, along the upper edge of the field to which it leads, and here in a spot directly North of Cuxton Church, both plants occurred in abundance'.

Great Wood. Photo by Stephen Lemon, 16 June 2012

Hanbury & Marshall (1899) said that the Kent plant had from time to time been reported as extinct; but that like many other annuals, it varied greatly in quantity from year to year, and had been found growing plentifully by Henry Lamb as recently as 1894 (there are also gatherings by Lamb dated 1880 and 1890 in **MNE**). C.E. Salmon (1902)[401] found it here, not very plentifully, in 1895; and 'It grew on the rough ground one so often finds in and on the borders of fields that are let go out of cultivation on the chalk downs, and was associated with many of the usual plants of that formation, such as *Echium vulgare*, *Origanum*, *Ajuga Chamaepitys*, etc. We could see no obviously introduced plants near, but *Salvia pratensis* was in abundance not very far away'.

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[400] Whilst this is the universally accepted view, it is curious that no mention has been made of John Parkinson's *Theatrum Botanicum* (1640). In this, he splits up mallows into three divisions, of which what appears to be Hairy Mallow ('Alcea minor villosa. Small hairy rough Vervaine Mallow') is the fourth of the second division. When he comes to treat of distribution (p.306), he deals with the first three mallows and then says 'the next two are also sometimes found wild with us', before dealing with more specific foreign localities : 'The fourth groweth at the foote of the mountain *Iura* in *Helvetia*' (it is indeed part of the Swiss flora). The reference to 'sometimes found wild with us' is a somewhat throwaway line, but if 'Alcea minor villosa' is to be equated with *Malva setigera* this would advance the wild status of this species by 150 years, which would add support to a reclassification as native or archaeophtye. It would also pre-date the first British record of the species in cultivation, in Edinburgh Physic Garden (James Sutherland, *Hortus medicus Edinburgensis*, 1683). Parkinson, however, was apparently inclined to attribute wild status to casual escapes and this may well be the case here, particularly as the reference to this plant is coupled with one to *Alcea Aegyptia moschata* (apparently *Malva aegyptia*, which has had no better status than casual in the UK).

[401] C.E. Salmon (1902). *Althaea hirsuta* in Surrey. Journal of Botany **40**: 409-412.

J.E. Lousley (1956)[402] wrote of the species in this location, perhaps from recollection of a visit in 1933, when he collected specimens now in **SLBI** and elsewhere; and he commented on the fluctuations in its occurrence and its proximity to other uncommon plants of the chalk. Francis Rose (specimens in **MNE**) collected it 1945-55, as from 'South of Great Wood, on downland and in chalky arable field' and similarly described habitat.

Great Wood. A plant still flowering at the end of October, when the remains of 304 flowers were present. Photo by Richard Moyse, 2011

The status of the plant was much the same when given by Philp (1982) as on 'Edges of fields and disturbed ground in the Cobham-Cuxton-Strood area TQ/66Y, 66Z and 76E'. The area, part of an SSSI whose notification reasons included arable weeds and 'perhaps of greatest interest' *Malva setigera*, subsequently became the subject of a management agreement with English Nature. Then the species was adopted by Plantlife under its 'Back from the brink project', an interest which (in conjunction with the presence of other plants of national interest at Ranscombe Farm) eventually led to the acquisition of Ranscombe by Plantlife in 2005. The attention which *Malva setigera* received as part of the 'Back to the brink project' and the management activities on the part of Plantlife have resulted in much data becoming available, e.g. Rich & King (1993), Rich & Ulf-Hansen (1994, 1995), Rich, Ulf-Hansen & Goddard (1996) and FitzGerald (1998)[403]. Some of this information is set out below together with subsequent records from other sources.

c.1980	Many hundreds of plants after pipeline dug across field.
1985	225 plants (Joyce Pitt)
1987	97 plants (Joyce Pitt)
1988	55 plants I(Joyce Pitt)
1989	2 plants (Joyce Pitt)
1990	few
1991	24 plants (Joyce Pitt)
1992	No plants seen in usual field, but one plant (Peter Marren & Jane Smart) seen at a field edge c. 200 yds below, TQ 701 677 (viz. in TQ76D).
1993	Over 250 plants in the woodland area and a few more in adjacent rape field. Field edge rotovated, March 1993, to create suitable conditions where lack of disturbance was believed to have resulted in a decline. Further cultivation into the field edge as far as the old hedgerow boundary was inhibited by a rabbit fence present 1.5m into the field, behind which a fairly closed turf canopy (Brachypodium pinnatum, agg., Tor-grass) had developed. However, a small area behind the fence was forked over.
1994	Over 100 plants (Joyce Pitt). Also 15 plants found by P.F. Ulse-Hansen on field edge where dug over in 1993; and another singleton. Further small areas of grassland dug over behind fence. Seedlings and young plants observed on pipeline, and one plant still in flower.
1995	A good year for the species (possibly due to weather), site visited by Tim Rich and Eric Philp in June (the species was given in Philp (2010) as present in TQ66Y and 66Z). Seven small plants seen on field margin near where seen in 1994, a bare area by the rabbit fence. Also, 171 plants seen on and near the corner of the ride inside the pipeline, many small but some very large. No plants along the edge of lower field or field to the east where previously seen,

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[402] J.E. Lousley (1950). *Wild Flowers of Chalk & Limestone*. New Naturalist series, Collins.

[403] Rich, T.C.M. & King, M. (1993). Hairy Mallow *Althaea hirsuta* L. at Cobham Wood SSSI, Cuxton, Kent. Plantlife report.
Rich, T.G.C. & Ulf-Hansen, P.F. (1994). The status of hairy mallow (*Althaea hirsuta*) in Britain in 1994. Plantlife project report no. 35.
Rich, T.G.C. & Ulf-Hansen, P.F. (1995). Hairy mallow (*Althaea hirsuta*) in Britain in 1995. Plantlife project report no. 58.
Rich, T.G.C., Ulf-Hansen, P.F. & Goddard, E. (1995). Hairy mallow (*Althaea hirsuta*) in Britain in 1996. Plantlife project report no. 77.
Fitzgerald, R. (1998). *Althaea hirsuta* – Hairy Mallow – Status of British records between 1792 and 1997. Plantlife report no. 98.

	or in the areas where dug over in 1994.h
1996	Site visited by Tim Rich and Andy McVeigh in May; and by Tim Rich and Ruth Davis in June. A total of 477 plants recorded, but likely to have been more. These included plants where dug over in October 1994 (showing response to disturbance work is c.18 months); plants on pipeline route, abundance attributed to hot summer of 1995; plants on site of burnt out stolen car, attributed to germination enhanced by fire.
1998	100+ plants (Joyce Pitt).
1999	60+ plants in gas ride above field; several large branching plants with flowers and fruit (Joyce Pitt)..
2000	One or two plants in western side of main ride edge (Joyce Pitt).
2004	One plant (Eric Philp & Peter Heathcote).
2005	Present at headland between TQ 70259 67732 and TQ 70276 67716, just after intensive arable cultivation ceased; also recorded quite often at eastern ride margin between TQ 69914 68061 and TQ 69977 68208 where less vegetated (Joyce Pitt & Anne Waite).
2010	On 24 June, about 15 plants along footpath at TQ 713 681 and a couple more a few yards away; not a usual site. Also 8 July, one plant up trackway from Kitchen Field, TQ 699 681 (Lliam Rooney). On 30 June, six small plants on bare ground patches under trees, top edge of Kitchen Field, TQ 69808 68111 (Sue Buckingham).
2012	134 plants (Richard Moyse)
2014	On 5 August, two plants above Kitchen Field, TQ 699 680; three plants in Kitchen Field at edge, TQ 698 680; 117 plants in disturbed grassland at edge of Kitchen Field, TQ698680. Total Ranscombe count, 123 plants (Richard Moyse).
2015	Field margin rotavated, avoiding plants which had germinated in previous season. Total Ranscombe count, 207 plants (Richard Moyse).
2016	TQ 708 675, edge of North Downs way, one plant (Geoffrey Kitchener).
2020	TQ 698 680, a small number of very small plants in disturbed ground at the edge of the grassland, Kitchen Field. TQ 710 683, a small number of plants flowering in the field margin, North Field (Richard Moyse).

The Ranscombe site may be seen in the context of the species' wider distribution, which in Europe is mostly southern, but extends northwards as far as Germany, Britain being at the north western limits of its distribution. Accordingly, climate constraints are likely to affect the persistence of its survival in Britain, and Ranscombe provides well-drained, warm, calcareous soils. Some of the variability in the size of populations from year to year presumably reflects adverse weather conditions – a hard winter or wet, cold conditions at germination time will be damaging. The other main cause of fluctuation in numbers is likely to be the disturbance regime. As an annual (normally), *Malva setigera*, requires open conditions: these may require disturbance to be maintained, which can be supplied by agricultural activities, by the use of paths or (recently) by conservation work. Disturbance will also assist by bringing the seed bank up to the surface, dramatically illustrated by pipeline works c. 1980. It is said that seed viability may reach 180 years[404]. Plants usually germinate in the autumn, overwintering and flowering from May to July although, if not cut short by a dry summer, they may flower for much longer.

Whether or not this population is a native one has long been the subject of differing views. It was accepted onto the British List (*A Catalogue of British Plants*, 2nd edition, 1835) by Henslow, who collected it himself in 1827, as 'Naturalized species, certainly not indigenous'. Syme in English Botany (vol.2, 1864) was also fairly forthright ('Very rare, and no doubt introduced'). There was an inheritance of views through the mainstream floras to Bentham's Handbook of the British Flora (1858 edition: 'Probably introduced as such into Kent, where it is said to have fully established itself near Cobham', although the Handbook was expressing less scepticism as regards the Somersetshire population by its 1887-1924 editions).

Hanbury & Marshall (1899) considered the species to be a native or denizen in Kent, and that the status at Cobham was as persuasively native as in Somerset: 'It has certainly held its ground for more than a century, and is quite as likely to have spread *into* the cultivated ground as *from* it'. The standard British Floras from 1952 to 1987 gave the species as 'doubtfully native'; but from 1991 onwards, 'probably introduced' or

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[404] www.plantlife.org.uk/publications/ARABLE_PLANTS_-_a_management_guide.pdf. This may be an allusion to Forey, E & Dutoit, T. (2012). Vegetation, soils and seed banks of limestone grassland are still impacted by former cultivation one century after abandonment. *Community Ecology* **13**: 194-202. The seed-bank in a French former field cultivated in the 19th century and abandoned was found still to contain *Malva setigera* seeds, an indicator of its arable history.

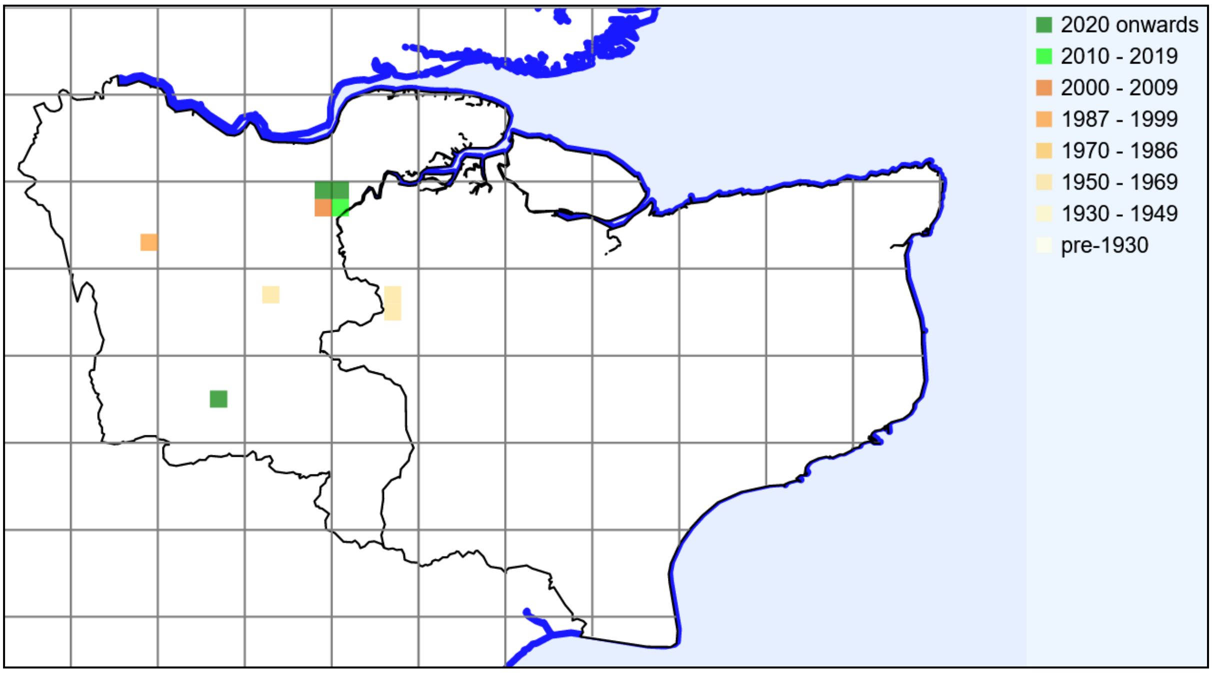
'introduced-naturalised'. The vascular plant red data book (editions from 1977 to 1999 only) inclined towards acceptance of its being native in Kent and Somerset. The *New Atlas of the British and Irish Flora* (2002) gave the species as a neophyte (post-1500 introduction); *Plant Atlas 2020* (2023) refers to it as a neophyte, with the Kent population sometimes considered native.

The most substantial arguments for native status are its relationship with European distribution, albeit on the margins, and the company it keeps in Kent, namely a number of species which are rare in Britain, generally with their main distributions focussed further south in Europe, and accepted as natives or archaeophytes in Britain. These are plants such as native *Ajuga chamaepitys* (Ground-pine); archaeophyte *Filago pyramidata* (Broad-leaved Cudweed); and native *Salvia pratensis* (Meadow Clary). The most substantial arguments for introduction are probably that it seems dependent on disturbance (but this would not preclude archaeophyte status); and that there is a relatively late date for its first discovery which amply post-dates its date of first cultivation in Britain. However, this last point seems weaker if is accepted that *Malva setigera* has been known in the wild in Britain by 1640 (see earlier footnote). Also relevant is that there have been frequent introductions of this species in Britain, which have generally been casual and impersistent. Casual occurrences in Kent are set out in the following table. Not all of them are 'one-off' – the species returned at Haysden after 13 years and then 18 years after that, and at Bredhurst the records spanned 37 years.

Early casual records are likely to derive from animal foods, foreign cereal seed or the product of seed-cleaning used as chicken-feed. Modern casual records may well have a relationship with introduced seed or represent the return from the seed bank of an older, perhaps undocumented, occurrence.

Malva setigera is a distinctively bristly (not downy) mallow with an epicalyx (the bracts outside the true calyx) of 6-10 lobes.

Malva setigera **Kent records to 2024 mapped at tetrad level, from BSBI database.**



Records excluding Ranscombe Farm

Site	Grid reference	Site status	Last record date	Recorder	Comments
West Wickham (metropolitan vc16)	TQ36		1883	A. Bennett	Garden weed

Nr. Chislelhurst station (metropolitan vc16)	TQ46		Before 1892	W.W. Reeves	Given in Hanbury & Marshall (1899). Soon disappeared.
Badgers Mount	TQ4962		1989	JES, JP	One well grown plant.
Haysden	TQ5645	Country park	(1) 9 June 2022 (2) 4 July 2004	(1) KBRG meeting (2) SB	(1) A single flowering plant at TQ 56329 45656 on sandy bank disturbed by repair work to flood barrier. (2) TQ 5633 4565, soil bank by lake access west of A21. A re-appearance following previous sighting here in July 1991. Soil likely to have been imported.
Maidstone Market	TQ75		1950	FR & CW	This may be a follow-up to CW's find of a casual plant in 19548 near Maidstone east.
Wouldham	TQ76		1840		Specimen in **BM**. May be some relationship with the Cobham locality, but this is on the other side of the Medway.
Bredhurst	TQ76 or TQ86		(1) July 1938 (2) July 1901	(1) John Braybrooke Marshall (2) John Masters (his son)	(1) Bottom of hedgebank, growing almost in wheel ruts of trackway from St Peter's Church to Bredhurst Hurst. (2) A few plants at the edge of a cultivated field (formerly laid to Sainfoin) a quarter of a mile south east of Bredhurst Church, on grassy bank, looking unlikely to set seed.

Medicago minima L. (Bartal.) (Bur Medick)

vc15; continued presence in vc16 requires confirmation

Rarity / scarcity status

Medicago minima is predominantly a coastal plant of sand and shingle, sometimes inland heaths, local in east England from Kent through East Anglia, including Breckland. It is **nationally scarce** and is regarded as **Vulnerable** to the risk of extinction, both in England and Great Britain as a whole. Its area of occupancy in England is taken to have declined by 44% in comparing records for the periods 1930-69 and 1987-99. In Kent, there appears to have been a decline of 56% between the surveys in Philp (1982) and Philp (2010), but some of that decline is due to the discontinuance of a source of introduced seed. Bur Medick falls just short of qualifying as scarce in the county, but its decline warrants its future being monitored. It is a Kent axiophyte and so is regarded as an indicator of good habitat.

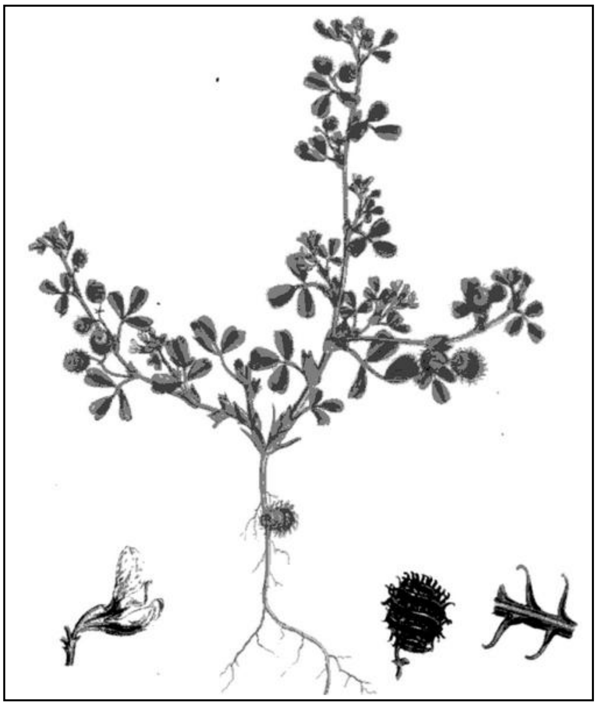


Illustration by James Sowerby of the first collected Kent specimen of *Medicago minima*.

Account

The first published record for Kent appears in Gerard Smith's *Catalogue of rare or remarkable phaenogamous plants collected in South Kent* (1829) as 'Upon sandy ground between Sandwich and Pegwell, abundant'; he also added a manuscript note to his own copy, 'at New Romney, Mr. Borrer'. The note probably derives from the publication in 1831 of the *Supplement to the English Botany of the* late Sir J.E. Smith and Mr. Sowerby, which illustrates a plant gathered by William Borrer in June 1828 at Romney Warren. Smith further described the find location as part of a tract which 'is sandy, running from Cliff-end, westwards to Sandwich; where it is interrupted, but resumed again upon the shore as far as Deal, constituting the Sand Hills'. Hanbury & Marshall (1899) considered Bur Medick to be a rare species of sandy and gravelly ground, especially near the sea, noting other records at Hythe, Seasalter, Sheppey and, somewhat more inland, Blackheath.

Littlestone. Photo by Lliam Rooney, 5 June 2010

Whilst it continued to be seen in coastal sites, Philp (1982) shows at least eight tetrad records (out of 25 tetrads) as being inland, and it is said to have been found in arable fields and the like, mostly introduced with wool-shoddy, a waste material from woollen mills used agriculturally to improve nitrogen content and water-retaining properties of soil. This source of foreign seeds came to the attention of English botanists in the late 1940s and Francis Rose and E.C. Wallace were the first to find shoddy plants in Kent, at Hextable in October 1948. A week later, David McClintock made a collection from the same site, which included var. *recta* of *Medicago minima.*[405] He also found the species as a shoddy alien at Birchington (1960), Sandwich (1959 and 1960) and Wrotham (1960) – specimens are in **MNE** – and finds at Bat and Ball, Sevenoaks; at Bourne Farm, Crouch; and at Knole (all 1960) look to be of the same nature. A similar origin may have applied to Clive Stace's 1960 record by a cultivated field on a farm in Yalding. The bur fruits seem well adapted to animal dispersal, including by sheep.

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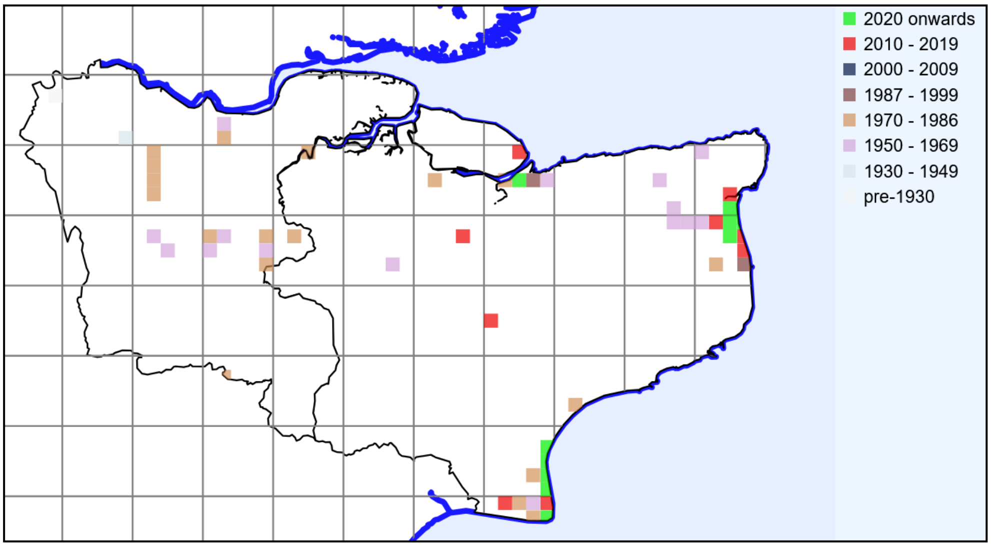
[405] Lousley, J.E. (1949). Botanical Records for 1948, in *The London Naturalist for the year 1948*, **28**: 26-36.

Littlestone. Photo by Lliam Rooney, 5 June 2010

By the 1991-2005 survey, published as Philp (2010), the use of wool shoddy had been discontinued, and the species no longer appeared in inland fields. Its distribution, on sandy or gravelly places on the coast, appeared limited to Greatstone/Littlestone; from Deal to Pegwell Bay; and near Seasalter. Records for 2010-24 amount to 19 tetrads (22 monads), and so exceed the 11 tetrads of Philp (2010), covering broadly similar locations so far as concerns the east coast, but also appearing elsewhere. The sighting on the east side of Sheppey appears new, and there is an inland record near Ashford in the company of good quality native sand flora. If the species is to be re-found at all now in West Kent, the Isle of Grain is perhaps the most likely place.

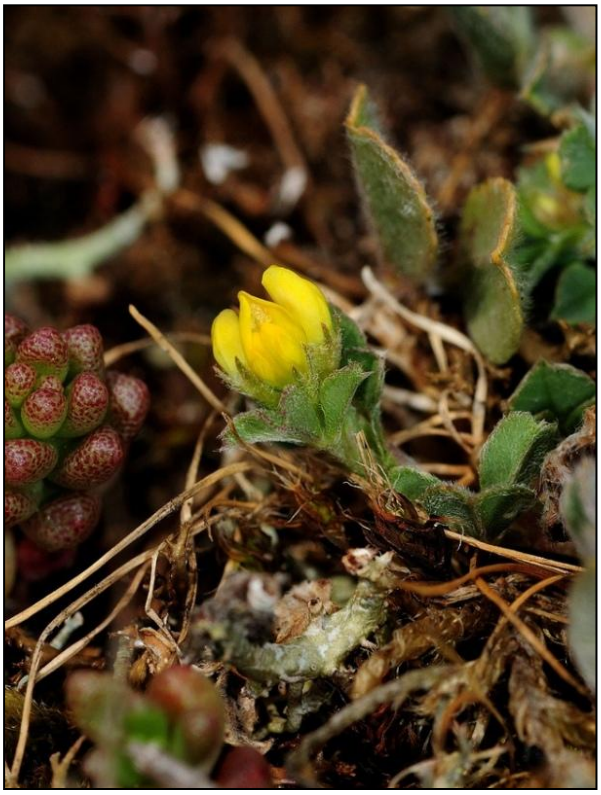
***Medicago minima* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Medicago minima is a prostrate annual, requiring open ground, both for seed establishment and avoidance of competition from taller vegetation. It germinates in autumn, the winter growth strategy fitting in with the ability to flower before summer drought, which may be more relevant to the Mediterranean part of its wider distribution.

Its current Kent habitats are largely on sandy shingle or dunes with associated grassland, often near roads or paths where the grass is kept low and there may be some disturbance. At Sandwich Bay it has been seen in closely mown grassland on roadsides and on a golf practice range, the grass being maintained low enough to avoid competition from taller vegetation. At Littlestone, it has been seen well scattered along the sandy shingle at the top of the beach – a relatively new habitat formed by sea defence works, so the species may act as a colonist.

Bur Medick is one of a number of medicks which may appear in its coastal habitats. *Medicago lupulina* (Black Medick) may be distinguished by its spineless fruits, black when ripe. *Medicago arabica* (Spotted Medick) has blotched leaves. *Medicago minima* (spiny fruits, leaves without blotches) is perhaps closest to *Medicago polymorpha* (Toothed Medick), with which it can grow, e.g. at Sandwich Bay estate. Both have coiled spiny fruits with at least three coils, although *M. polymorpha* occasionally lacks spines; but *M. minima* is generally a smaller plant, very downy throughout (*M. polymorpha* is glabrous or sparsely hairy), and with untoothed stipules (the other has deeply cut stipules).



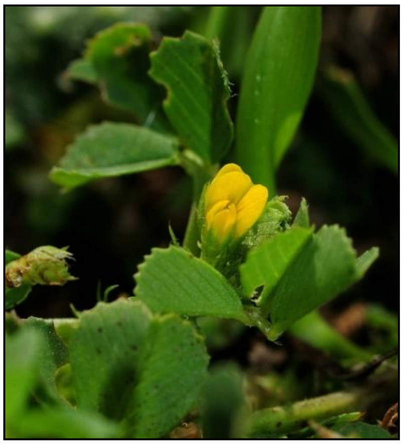
Littlestone. Photo by Lliam Rooney, 11 June 2011

Medicago polymorpha L. (Toothed Medick)

vc15 and 16

Rarity / scarcity status

Medicago polymorpha as a native plant is scattered on sandy ground along the south coast and the East Anglian coast. Its conservation risk rating is one of 'Least Concern', both in England and in Great Britain as a whole. In England, that rating reflects an analysis of change recorded for period 1930-99, but a 50% decline was detected when analysing 1987+ data as proportion of all records including pre-1930 data. In Kent, there appears to have been a 53% decline between the surveys of 1971-1980 and 1991-2005; but virtually all that loss is likely to be attributable to the discontinuance of the use of wool shoddy contaminated with seeds as field manure (see also the account for *Medicago minima* (Bur Medick), whose distribution and history is very similar). In any event, the survey data for 2010-23 are not as pessimistic as the 1991-2005 records and do not support such a decline. Toothed Medick is not sufficiently uncommon in Kent to merit a rarity or scarcity rating; but it is a **nationally scarce** species. It is a Kent axiophyte and so is regarded as an indicator of good habitat.



Littlestone. Photo by Lliam Rooney, 11 June 2011

Account

The first published record for Toothed Medick in the county is by Christopher Merrett in his *Pinax rerum naturalium Britannicum* (1666), given as Sea-Medick 'At *Rumney* betwixt the Town and *Cony-Warren'.* There are of course several 'warren' place-names along Dymchurch Road north east of New Romney, culminating in sandy area known as 'The Warren', and *Medicago polymorpha* remains present (2019) at Littlestone Warren.

Pegwell Bay. Photo by Sue Buckingham, 26 May 2016

Hanbury & Marshall (1899) assessed the species as rather rare, growing on 'sandy or gravelly ground, chiefly maritime', although there were historic inland records for Blackheath. They also gave an anomalous record from J.E. Little as from 'Medway Valley, between Penshurst and Maidstone, on sand of the Lower Greensand, and also on gravel above clay' which was somewhat misleading, and actually should have stated the find as being on railway ballast between Hildenborough and Tonbridge (1879,when Little was a schoolboy)[406]. Coastal records given included Crossness, Sheerness, Whitstable, Thanet, Pegwell Bay/Sandwich/Deal/Walmer, Folkestone, Hythe/Dymchurch and Dungeness.

Coastal habitat details were noted by Francis Rose for collected specimens in **MNE**, e.g. sandy cliff tops, Folkestone Leas (1945); dune grassland, Littlestone (1946); consolidated shingle beach west of Hythe (1955); and shingle beach by road across Hythe Ranges (1958). At that time also, records were beginning to appear for plants from seed introduced from wool shoddy spread in fields, just as with *Medicago minima*. David McClintock found such introductions at Wrotham station (where shoddy was presumably off-loaded) and Basted, both in 1960. Clive Stace found in 1961 (as he had for *Medicago minima* in 1960) the species growing at the edge of a cultivated field at Yalding. Such inland occurrences were still taking place during the survey for Philp (1982), which recorded the species in 32 tetrads. Toothed Medick was then said to be rare on sandy or gravelly ground near the coast in the Sandwich-Deal-Walmer area and in the Greatstone-Littlestone area; elsewhere in Kent sometimes introduced with wool shoddy, although at some localities it had been known for many years.

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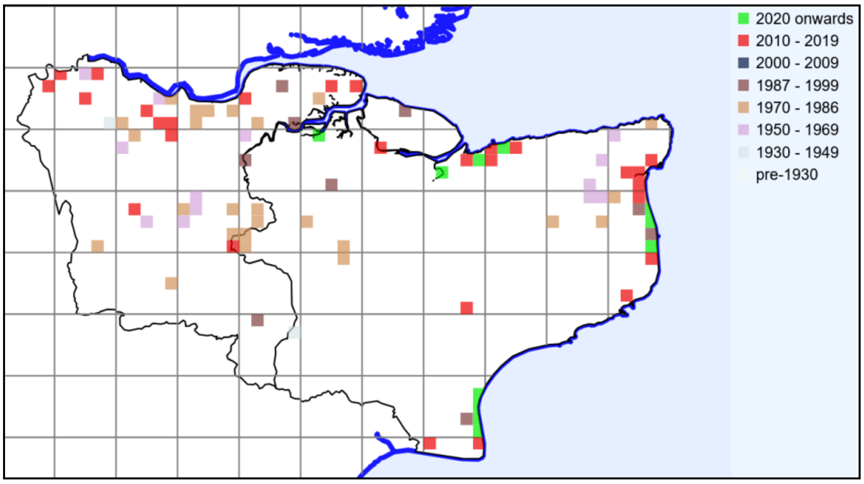
[406] Corrected in correspondence between J.E. Little and C.E. Salmon in 1929, held by GK.

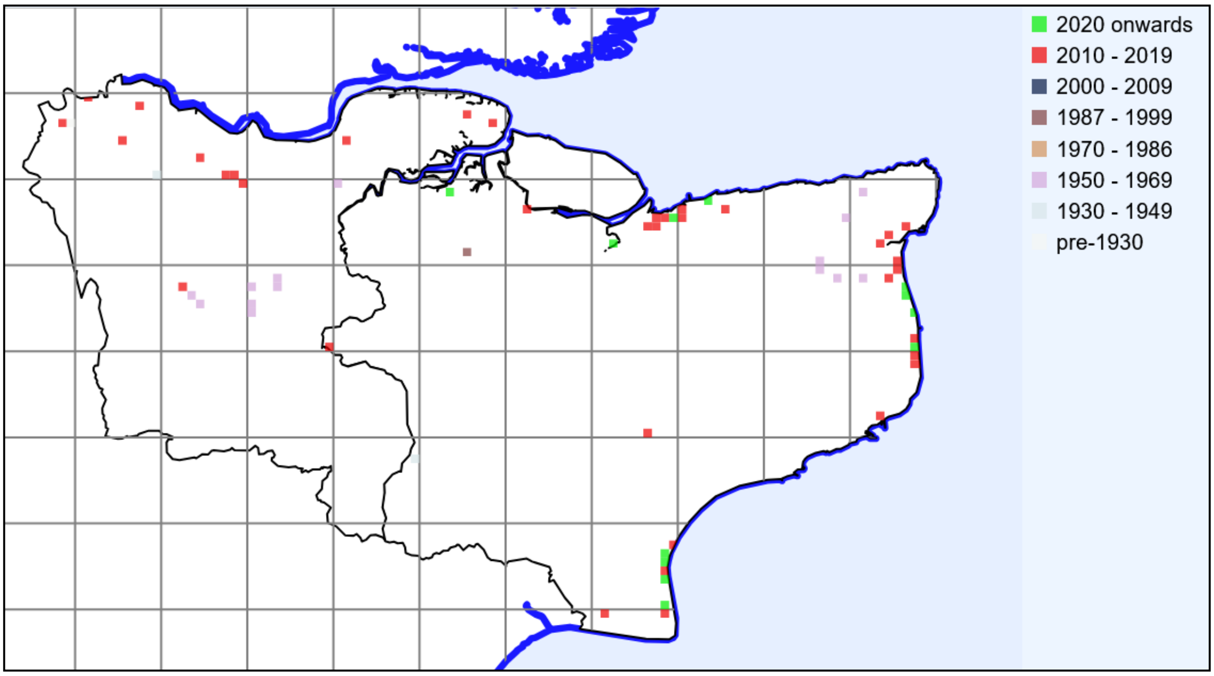
By the time of the 1991-2005 survey (Philp, 2010), the number of tetrads had reduced to 15, but most of this change was due to the discontinuance of wool shoddy, so that the distribution reverted to the basic native coastal occurrences. The former inland sites may be seen on the accompanying distribution map at tetrd level



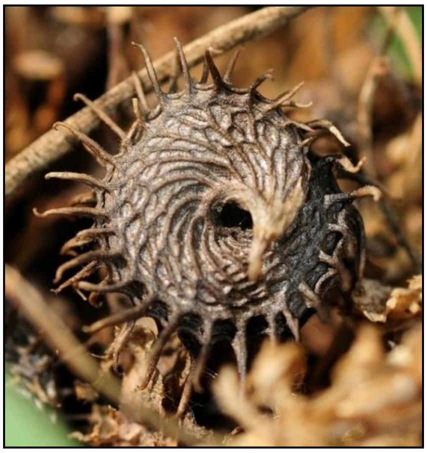
Medicago polymorpha **Kent records to 2024 mapped at tetrad level, from BSBI database**

Our 2010-24 records amount to 40 tetrads (49 monads), exceeding 1971-80 recording levels, and are best viewed at the higher resolution of the monad distribution map below. This has fewer historic records, as monad recording only became the norm in Kent from 2010.

Medicago polymorpha **Kent records to 2024 mapped at tetrad level, from BSBI database**

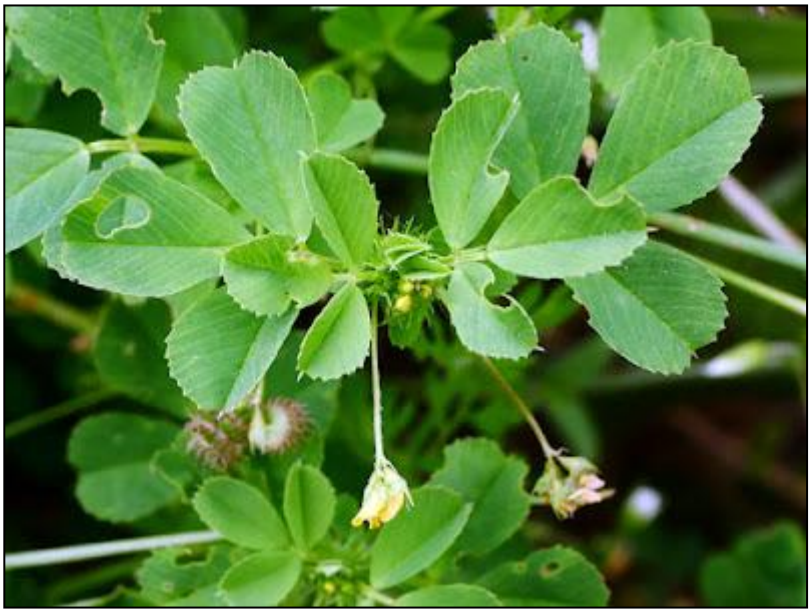


As regards the now relatively few inland occurrences, the record at TQ6950 was from recently disturbed ground at a former arable field, Yalding (2012) and may represent survival in the seed bank from old shoddy-related presence. Those in metropolitan West Kent and at or near Green Street Green, Longfield (TQ5870, TQ5969) and a supermarket car park near Sevenoaks (TQ5357) do not have an obvious origin, although Rodney Burton suggests (*in litt*.) that, at least in recreational areas, there may be potential for seeds to be transferred on the hairs of dogs who have been exercised on coastal dunes. However, the finding by Juliet Cairns of one plant of *Medicago polymorpha* on the south west edge of Blackheath (TQ3876) may be a relict of historic inland presence, echoing the record of this for Blackheath by Alexander Irvine in his *Illustrated Handbook of the British Plants* (1858) and by 'E.J.' in 1855 (*The Phytologist* N.S. 1:166).


Littlestone. Photo by Lliam Rooney, 11 June 2011

The distribution and habitat preferences of *Medicago polymorpha* broadly resemble those of *Medicago minima* (see account for that species), with which it has been found growing, e.g. at Sandwich. Similarly, it is a winter annual, whose growth begins with rain in autumn, flowering with us from May. It appears from the species' behaviour in California, where it is an introduction (indeed, it is used for nitrogen-fixing and as a component of pasturage in semi-arid areas), that 40% of the viable seed in its seed bank remains dormant and carries forward, so that germinating individuals in large part derive from seed of previous years. Open ground presumably meets its requirements for seedling establishment and avoidance of competition. This may be through trampling and other disturbance by coastal paths and roads, or through summer scorching of plants generally on sandy coastal terrain.

For identification issues in relation to coastal medicks, see the account for *Medicago minima*.


St. Mary's Bay. Photo by David Steere, 23 May 2023

Medicago sativa subsp. *falcata* (L.) Arcang. (Sickle Medick)

vc15 and 16

Rarity / scarcity status

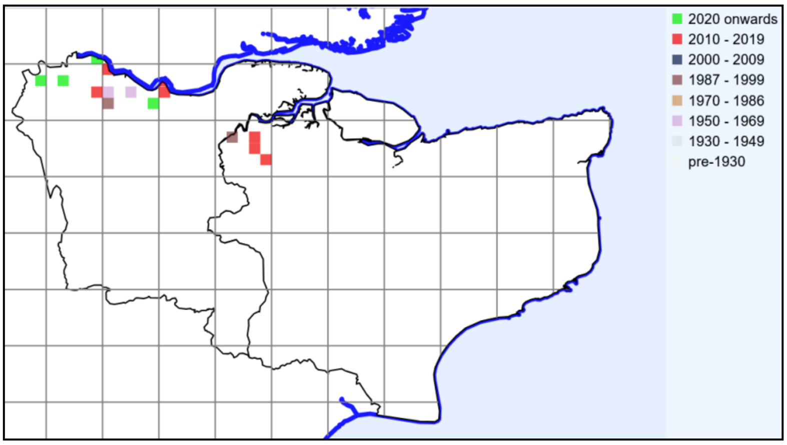
Sickle Medick is a native perennial, at least in parts of East Anglia and with a scattered distribution elsewhere, mainly in southern England, where it is largely casual. Its threat status for conservation purposes in both England and Great Britain as a whole is one of 'Least Concern', based on any trend shown by 1930-1999 data, but if English 1987+ data are considered as a proportion of all records, including pre-1930 data, then a significant decline of 63% is indicated. Sickle Medick is **nationally scarce**, and in Kent it is **scarce** also.

Account

The first Kent record is by G.E. Smith in his *A Catalogue of Rare or Remarkable Phaenogamous Plants, collected in South Kent* (1829), where he refers to this plant as having been 'gathered by a party of young Botanists, with Silene noctiflora, Erigeron acre, and Antirrhinum spurium [*Kickxia spuria*] at Dumpton Gap, near Ramsgate.' This suggests a chalky arable margin context, or similar. Hanbury & Marshall (1899) regarded it as a rare straggler in the county.

Swanscombe peninsula. All photos by Lliam Rooney, 23 August 2015.

Francis Rose, however, in his manuscript *Flora of Kent* considered it to be naturalised in rough fields, on dunes, riverbanks and roadsides with, in the 1940s and 1950s, a distribution which extended from the north west (e.g. Dartford Heath and Blackheath), to the lower Medway (Strood, Wouldham, New Hythe and locally plentiful in a riverside field at Aylesford), to Sevington near Ashford and to Thanet/Sandwich (where present in beach, sand dune and cliff top habitats). This last area provided some continuity as far as the 1971-80 county survey (Philp, 1982) which recorded it at TR36L (Sandwich/Pegwell Bay) together with TQ65Z (Leybourne) and TQ75J (Aylesford), both of these latter sites possibly also offering some continuity with the 1940/50 records, although Eric Philp treated them as casual roadside or waste ground records.

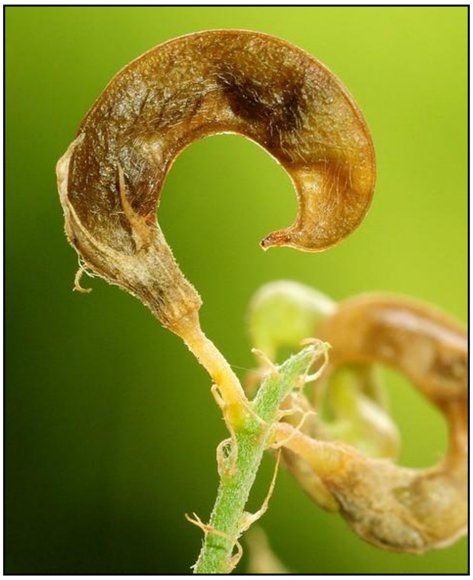


***Medicago sativa* subsp. *falcata* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Eric Philp's later records are somewhat puzzling. Philp (2010) gives only one casual plant for 1991-2005, on disturbed waste ground at Gillingham. On the other hand, the BSBI database (to which his records were transferred) gives others for 1991-99, and these are shown on his recording cards. These additional sites were west Dartford Heath (TQ57B), Swanscombe (TQ67C), Swanscombe Marshes (TQ67D), Capstone Country Park (TQ76S) and Borstal/Cuxton (TQ76I). There is no obvious explanation for their omission. Our recent records, for 2010-24, amount to 11 tetrads (equating to the same number of monads) and show that Sickle Medick remains scarce in the county, but has been most frequently encountered in the Chatham / Gillingham area and in north west Kent from Swanscombe westwards.

The Swancombe peninsula has emerged as an important county site for Sickle Medick. It is not one of the species which was cited by Natural England as substantiating the decision to declare the peninsula an SSSI in 2021, but is part of an assemblage of legumes there including *Lathyrus aphaca* (Yellow Vetchling) and *Vicia bithynica* (Bithynian Vetch), which were cited. Because of The London Resort development proposals for the peninsula which were overtaken by the SSSI declaration, a number of ecological surveys were carried out and published, which include data on Sickle Medick. A survey in May-June 2015 found *Medicago sativa* subsp. *falcata* to be present as a medium-to-large population, at least in hundreds, at 'Grassland, especially G1 [this is a large area mostly at Broadness, TQ6076.] beside tracks in the centre of the Peninsula. Mixed with ssp. *sativa* and *varia* and the least frequent/abundant ssp.'. It was also stated that 'sickle medick is frequent and locally abundant in parts of the grassland, especially alongside the main east-west track across the Peninsula'.

In a follow-up survey in 2020, however, only one plant was recorded, to the immediate south of the old jetty area (and so presumably in the vicinity of TQ 600 760), within the previous general area of record. The developers' ecologists considered the possibility that it might have been hybridised out through contact with neighbouring *Medicago sativa* subsp. *sativa* (Lucerne), which would produce nothosubsp. *varia*. However, when the survey was undertaken, very few plants of *M. sativa* were sufficiently advanced so as to show the mature pods required for accurate determination.



Potential for confusion in identification arises because subsp. *sativa* has flowers which are pale mauve to violet, subsp. *falcata* has yellow flowers, and the fertile cross nothosubsp. *varia* can also have yellow flowers, although they are often black, violet, green or an intense blue, sometimes on the same plant. Determination therefore cannot be based on flower colour alone, but needs to take account of the degree of curvature of mature pods: no more than half a circle in subsp. *falcata*, 2-3(4) complete turns in subsp. *sativa* and 0.5-1.5 complete turns in nothosubsp. *varia*.

As a recognised native in East Anglia, subsp. *falcata* grows on lightly acid coarse sand and gravels and on chalk grasslands where competition is reduced by summer drought[407]. In Kent, it appears that native status would be achievable only if its presence is not due to intervention by man. There is not a clear explanation generally for its Kentish occurrences and, while some records are casual, further study is needed regarding persistence generally. It grows in Kent on various substrates, on gravelly ground at Blackheath, and on highly calcareous ground reflecting presence of cement kiln dust at Swancombe.

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[407] Pearman, D.A. (1994). *Medicago sativa* subsp. *falcata* (L.) Archang. Sickle medick, in (eds.) Stewart A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Blackheath west (metropolitan vc16)	TQ3876		(1) 2 July 2021 (2) 29 August 2012	(1) RMB & JC (2) JC	(1) N of Mounts Park Road in SW corner of Blackheath, TQ 382 764, Large very conspicuous patch. (2) Some patches behind TA house (south west).
Woolwich Common (metropolitan vc16)	TQ4277		(1) 4 August 2024 (2) 2 September 2011	(1) GH & JL (2) JC	(1) TQ 42757717. One patch, 3m x 1m, near track across Woolwich Common. (2) Scrub north of Green Chain Walk.
Bexleyheath east (metropolitan vc16)	TQ4975		6 July 2015	CR	Dominant plant in front gardens of new-build houses in Watling Street just uphill from TQ Centre.
Belvedere (metropolitan vc16)	TQ4980		17 September 2024	MR	TQ 493 807, a couple of plants beside the Thames Path.
Dartford Heath west	TQ57B		1991-99	EGP	TQ57B.
Belvedere north west (metropolitan vc16)	TQ5079		18 June 2016	MR	TQ5079.
Bluewater east	TQ5873		7 July 2020	GK	TQ5873.
Swanscombe	TQ67C, includes TQ6075	SSSI	(1) 23 August 2015 (2) 13 July 2014 (3) 1991-99	(1) KBRG meeting (2) GK (3) EGP	(1) Widely scattered. (2) TQ6075. (3) TQ67C.
Swanscombe peninsula	TQ67D, includes TQ6076	SSSI	(1) 13 July 2014 (2) 1991-99	(1) GK (2) EGP	(1) TQ6076. (2) TQ67D.
Rochester	TQ76I		1991-99	EGP	TQ76I.
Capstone	TQ76S, includes TQ7665		(1) 4 July 2015 (2) 1991-99	(1) DC (2) EGP	(1) TQ7665. (2) TQ76S.
Luton	TQ76T, includes TQ7666		(1) 4 July 2015 (2) 14 October 2004	(1) DC (2) EGP & DG	(1) TQ7666. (2) TQ76T.
Wigmore	TQ7963		14 October 2016	SP & DG	TQ7963.

******Melampyrum pratense*** L. (Common Cow-wheat)**

***subsp*. pratense**
subsp.* commutatum *(Tausch ex A. Kern.) C.E. Britton (Chalk Cow-wheat)

vc15 and 16

Rarity / scarcity status

Melampyrum pratense is a hemiparasitic plant widespread in the British Isles, although less so in central England and some parts of the east. It is not regarded as being at risk in Great Britain as a whole (its threat status being of 'Least Concern'), but in England it is treated as **Near Threatened** as there is evidence of losses: its area of occupancy in England is taken to have declined by 28% in comparing records for the periods 1930-69 and 1987-99. The position in Kent also appears to be one of decline, with 48% fewer tetrad records made in the 1991-2005 county survey (Philp, 2010) than during 1971-1980.

There are two subspecies with distinct habitat preferences: subsp. *pratense* (acid ground) and subsp. *commutatum* (base-rich). There are not given separate conservation status, due to the limited information regarding their occurrence. Similarly in Kent, although we know that both subspecies are present, and we could guess the subspecific identity of many records from the geology of their location, we have limited confirmed data as regards their respective abundance. Both subspecies were placed on the county rare plant register in order to encourage their recording and no rarity or scarcity designation is currently made for them in Kent. The species as a whole is not uncommon in the county. Both subspecies are Kent axiophytes and so treated as indicators of good habitat, each indicating a slightly different type of habitat.

Brasted Chart, subsp. *pratense*. Photo by David Steere, 31 May 2015

Account

The first published notice of the species growing in Kent was by Thomas Johnson who, in his *Iter Plantarum* (1629), mentioned it as encountered in travelling by the main road from Gravesend to Rochester. Johnson listed *Melampyrum* next to *Cirsium acaule* (Dwarf Thistle) and *Carlina vulgaris* (Carline Thistle) and if they were growing together, it will have been chalk, which is the underlying geology of much of the route – so the possibility is that the plant was subsp. *commutatum*. There is earlier archaeological evidence: ten capsules and many seeds (determined by J.R.B. Arthur) were found in clay daub from the late 14th century timber-framed building known as Wealden Hall, London Road, Larkfield[408]. Hanbury & Marshall (1899) considered Common Cow-wheat to be very common indeed in the county as a whole, except Thanet, in woods and copses and so they supplied no individual records for the normal form. Individual records are given there, however, for var. *latifolium*, a taxon which was taken off the British list after Gustave Beauverd published his *Melampyrum* monograph in 1916. Francis Rose regarded the species to be a locally common native of dry woodlands, scrub and wood-borders, growing on gravel, sand, and chert, and on chalk; common on Tertiary soils, frequent on the chalk between the Stour and the east coast, occasional on the Folkestone sand and on the Hythe Beds chert plateau, occasional on the Weald Clay and on the Tunbridge Wells Sand in the High Weald; unrecorded from the marsh districts and from Thanet.

By the time of Philp (1982), *Melampyrum pratense* remained locally common, being found in 153 tetrads in the period 1971-1980. These tetrads showed particular concentrations in Wealden wooded areas on Tunbridge Wells Sand, the London Clay of the Blean woodlands, the chalk around Elham valley and some records along the Folkestone and Hythe Beds of west Kent. The plant was relatively absent from more treeless areas –the Hoo peninsula, Sheppey, Thanet and Romney Marsh/Dungeness. However, by the 1991- 2005 survey (Philp, 2010) the number of tetrads recorded had dropped to 79. The previous concentrations remained, but in attenuated form. It was noted that subsp. *pratense* occurred on the more neutral and acid soils, and that subsp. *commutatum* was found on chalky soils, but they were not then mapped separately.

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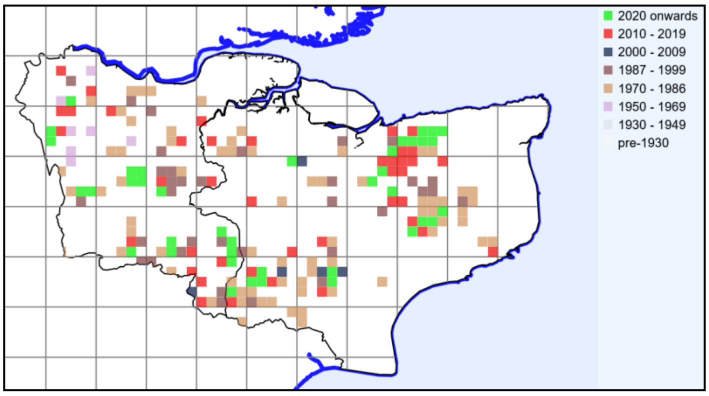
[408] Grove, L.R.A (1964). Archaeological notes from Maidstone Museum. *Archaeologia Cantiana* for 1963, **78**: 188-203.

***Melampyrum pratense* Kent records to 2024 mapped from BSBI database**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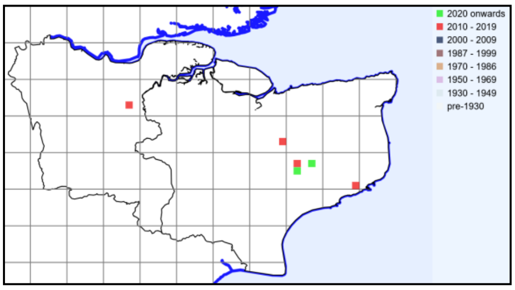
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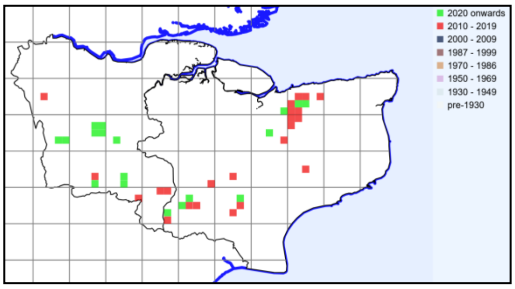
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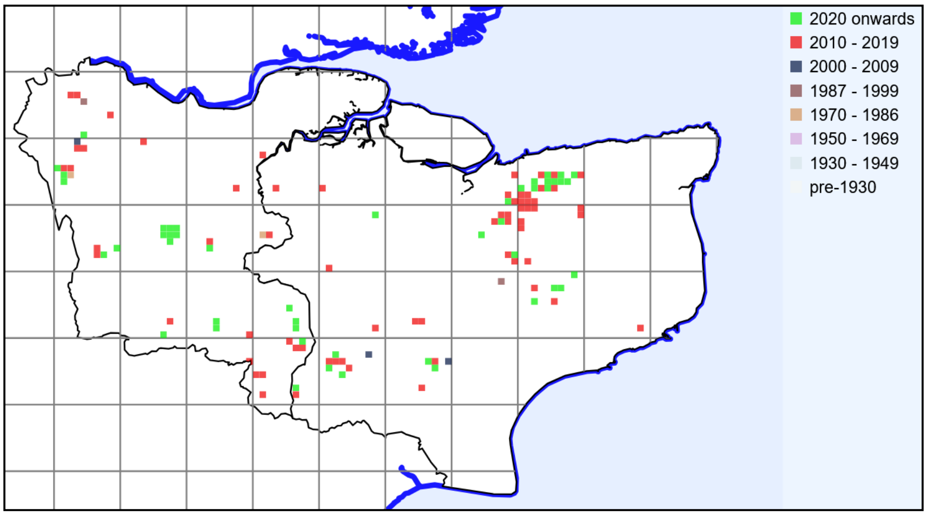
■ 1930 - 1949
pre-1930

Above: *Melampyrum pratense*, all records at tetrad level.
Upper right: subsp. *commutatum*, records at tetrad level.
Lower right: subsp. *pratense*, records at tetrad level.
Below: *Melampyrum pratense*, all records at monad level.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■ 1950 - 1969
■ 1930 - 1949
pre-1930

Our 2010-24 records were made in 80 tetrads (113 monads). Because nine of those tetrads lie in Greater London, which the surveys of 1971-80 and 1991-2005 did not cover, then it appears that the decline between those two surveys is – just - still continuing.

Our recent records are mapped with subspecies shown where identified, and their locations follow the underlying geology as might be expected, with subsp. *commutatum* being the less common subspecies; but in most cases recorders have simply recorded the species.

As regards the losses, it may be that there are some similarities (at least in relation to subsp. *pratense*) with the decline of *Lathyrus linifolius* (Bitter-vetch), which also frequents shaded, nutrient-poor habitats, often lane-banks; but the well-being of *Melampyrum pratense* Is complicated by also having a host plant relationship.

We have many records from the Blean, where there are abundant colonies, encouraged by wood management for its benefit, as it is a food plant, together with *Digitalis purpurea* (Foxglove), for the larvae of the Heath Fritillary butterfly. Conservation effort was driven particularly by the butterfly having approached near-extinction in the 1970s.

Common Cow-wheat is an annual[409], germinating in December so as to develop an extensive root system but showing little vegetative growth until March. Rapid growth appears to take place towards the end of March if a relationship is established with a suitable host plant, and then flowering takes places within six to eight weeks. In the absence of contact with a suitable host, the plant withers away after production of a few small stem leaves. Its hemiparasitic nature enables it to thrive on nutrient-poor soils, since in these locations its nutrients are at least in part being derived from its host, generally a woody plant. The relationship also seems to enable the acquisition of a water supply from the host: Smith (1963) remarks on a dry period in summer 1959, when a healthy population was seen in a wood on Keston Common, where other herbaceous plants were dead or dying.

Our recent records include limited data as regards the most frequent host plants, but where a population is growing in relatively bare terrain, it should be possible to assess the most likely candidates amongst nearby trees or shrubs. We have noted *Quercus* sp. (Oak) and elsewhere *Corylus avellana* (Hazel) coppice (in which *Orchis purpurea* (Lady Orchid) and *Ophrys insectifera* (Fly Orchid) were also present), but most of our data as regards associates comes from the 1950s. It is harder to form a view about the host plant in those locations on chalk where a chalk grassland flora is present, but Chalk Cow-wheat has been noted in *Brachypodium pinnatum* agg. (Tor-grass) grassland in which scrub was spreading out from an adjoining wood; and it is likely that the scrub species (*Corylus avellana* (Hazel) and *Viburnum lantana* (Wayfaring-tree) were acting as hosts. It may be that growth of the Common Cow-wheat is also enhanced by fungi associated with host plants – increased performance has been observed in Scandinavia in the presence of *Pinus sylvestris* (Scots Pine) with ectomycorrhizal fungi associated with their root systems[410]

Holly Hill, subsp. *commutatum* on Hazel.
Photo by David Steere, 5 August 2015

The two subspecies are distinguished (apart from habitat preferences) mainly by leaf shape. The uppermost leaves of subsp. *commutatum* (i.e. below the bracts) are wider – appearing as ovate-lanceolate, mostly 3-8 times longer than wide (cf. subsp. *pratense*, lanceolate to linear-lanceolate, mostly 7-15 times as long as wide). Its corolla tube is often longer, at 13-15.5mm (cf. subsp. *pratense* at mostly 12-14mm), but there is overlap between the taxa. The position as regards leaves is not straightforward in Kent, as Smith (1963) remarks on Kentish populations inter-grading in leaf shape where there are plants growing in calcareous and non-calcareous habitats in the same area, and Francis Rose said that there were similar populations in the Pas de Calais. The cause may have been introgression as between two originally distinct populations, or it may have been selection still in progress for broad-leaved forms in calcareous habitats where only an originally narrow leaved population was present. As a result of Smith's studies, nearly all the Kent *Melampyrum pratense* specimens in **MNE** are determined to subspecific level and many were collected by him. His specimens generally have a record of associated species and it is noticeable that those for subsp. *pratense* may include *Castanea sativa* (Sweet Chestnut) and *Quercus robur* (Pedunculate Oak), whilst those for subsp. *commutatum* may include *Sorbus aria* (Common Whitebeam) and *Viburnum lantana* (Wayfaring-tree). *Corylus avellana* (Hazel) often accompanies either. Plants intermediate between the two taxa were found near Selling in a coppiced wood with fairly neutral soil (at pH 6.8); on a sunny chalk bank at Maxted Street, Elsted; and on chalk grassland at Yockletts Bank.

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[409] Smith, A.J.E. (1963). Variation in *Melampyrum pratense* L. *Watsonia* **5**: 336-367.

[410] Salonen , V. & Setälä, H. (2000). The interplay between *Pinus sylvestris*, its root hemiparasite, *Melampyrum pratense*, and ectomycorrhizal fungi: Influences on plant growth and reproduction. *Écoscience* **7**: 195-200.

Brasted Chart habitat, subsp. *pratense*.
Photo by David Steere, 31 May 2015

Bredhurst habitat, subsp. *commutatum.*
Photo by David Steere, 22 July 2015

Mentha arvensis L. (Corn Mint)

vc 15 and 16

Rarity / scarcity status

Mentha arvensis is fairly common throughout the British Isles in fields, wood margins, clearings and by ponds and ditches. In Great Britain as a whole, its conservation risk status is one of 'Least Concern', but in England, its rate of decline is such that it has been assessed as **Near Threatened**. Its area of occupancy in England is taken to have declined by 25% in comparing records for the periods 1930-69 and 1987-99. In Kent, there has been a reduction of 41% in tetrad records as between the surveys of 1971-80 (Philp, 1982) and 1991-2005 (Philp, 2010). However, it is still neither rare nor scarce in the county. It is a Kent axiophyte and so is regarded as an indicator of good habitat.

Meopham. Photo by David Steere, 24 July 2016

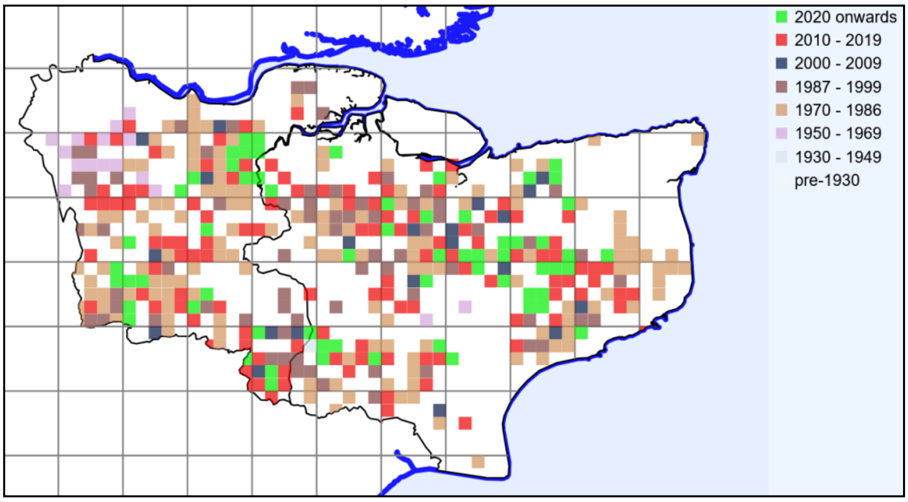
Account

The position is not straightforward as regards the first publication of a Kent record for *Mentha arvensis*. Hanbury & Marshall (1899) say that it was by Thomas Johnson in his *Iter Plantarum* (1629) in course of travel from Grain to Cliffe via Stoke, High Halstow and Cooling. The plant was called by Johnson '*Calamintha aquatica Belgarum*' Lob., and the question arises as to what species Johnson meant by this. Francis Rose in the 1972 edition of *Iter Plantarum* said that Gerard's illustration appeared to be *Mentha arvensis* (as indeed it does), but that Johnson could have found *Mentha aquatica* instead. However, as Johnson referred to Lob. (i.e., de L'Obel) as the author of this plant name, then it is relevant that de l'Obel's *Icones Stirpium* (1591) illustrates a plant under this name. This illustration is the same as that used in Gerard's *Herball* (1597), and the second edition (1633) of the *Herball* was edited by Johnson. So we may take it that both Gerard and Johnson considered that *Calamintha aquatica Belgarum* was the illustrated plant, which is persuasive as to *Mentha arvensis* having been found

Brenchley. Photo by Sue Buckingham, 2012

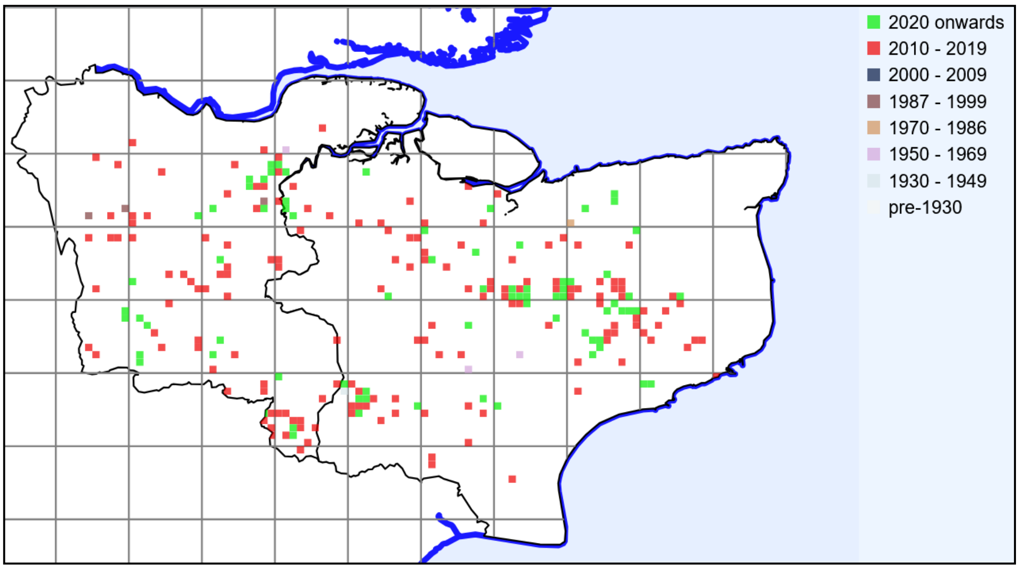
Hanbury & Marshall (1899) regarded the species as being very common in fields, waysides, etc. and to be found across the county. They gave specific record details for a number of varieties, but because of the number of named varieties and the existence of intermediates between them, these are no longer regarded as having much taxonomic significance. Philp (1982) gives 286 tetrads in which the species was found during the period 1971-80; it was considered to be locally frequent in arable fields and woodland rides. There were distribution gaps in the Hoo peninsula, Sheppey, north east Kent (Thanet and environs), Romney Marsh and TQ74 and TQ84 in the low Weald. These gaps were still substantially present in Philp (2010) in which, however, only 170 tetrads were recorded for 1991-2005. It was then said to be a plant found in woodland rides and open wet areas within woods, 'Also as a weed of arable fields where it has become less frequent in recent years'.

Records for 2010-24 show a similar pattern, but with 177 tetrads (232 monads), which include four Greater London tetrads (an area not covered by the earlier surveys), so that the earlier substantial decline may have stalled.



***Mentha arvensis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The scale of loss after the 1970s depicted by the tetrad distribution map is substantial and applies across the plant's range; there are three hectads in the Kentish part of which it could no longer be found at all after 2010, although present before 1980, and most others show depletion. The following map at monad level shows the current position at higher resolution; it lacks older records as monad recording only became the norm in Kent from 2010. *Plant Atlas 2020* refers to a decline since the 1960s, as the damp, unintensively farmed ploughland which Corn Mint favours has been improved or changed to pasture. Conversion to pasture may have limited relevance to Kent, but intensification of farming may have had impact, mitigated only more recently by the frequency with which marginal strips to arable are left.



***Mentha arvensis* Kent records to 2024 mapped at monad level, from BSBI database.**

Mentha arvensis is a perennial, sometimes annual, plant still present in some arable habitats, such as afforded by Ranscombe Farm, but when in perennial mode, presumably requiring some herbicide-free marginal terrain. In a woodland context, it appears to favour dampish areas, seasonally flooded, with a reasonable amount of light, and its associates include *Juncus* spp. (rushes) and *Persicaria hydropiper* (Water-pepper). There it will overlap with *Mentha aquatica* (Water Mint), although the latter generally grows in more permanently wet conditions. They may be distinguished through Corn Mint possessing whorls of flowers up the stem, terminating with leaves or a very small whorl. Water Mint has a large, rounded terminal head of flowers.

The hybrid, *Mentha x verticillata*, is recorded occasionally in Kent: eight tetrad records in Philp (1982), nine in Philp (2010) and 26 (29 monads) for the period 2010-24. Recent records include plants growing close to either *Mentha arvensis* or *Mentha aquatica*, but with the other parent present in the vicinity; and also in the absence of both parents. The hybrid generally appears somewhat like very robust *Mentha arvensis*, with numerous whorls of flowers diminishing in size up the stem, generally without a terminal flower head; or if there is one, then it is very small. The hybrid usually has stamens not projecting from the flowers, and narrowly triangular calyx-teeth (cf. the shallow, blunt calyx-teeth of *Mentha arvensis*).

Mentha pulegium L. (Pennyroyal)

vc 15 and 16

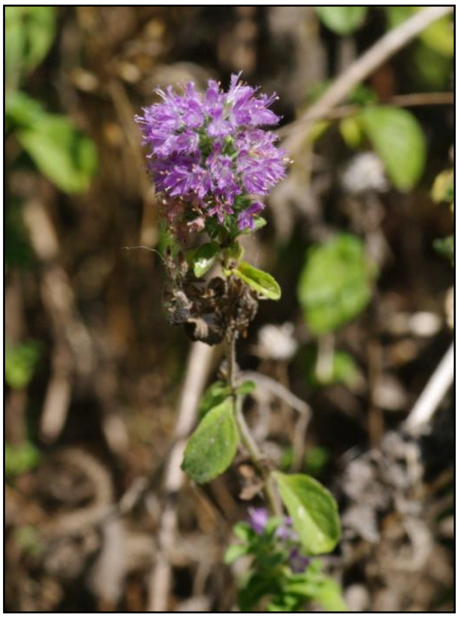
Rarity / scarcity status

Pennyroyal is in the British Isles very local as a native plant, growing on damp trampled ground, especially heaths and common land. As an introduced grass-seed contaminant, it is much more widespread. It is protected from uprooting, picking and sale under the Wildlife and Countryside Act 1981 as amended. It is also a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006 and is assessed as **Endangered** in Great Britain, but in England it has seen drastic decline and its conservation risk status is **Critically Endangered**. These assessments relate to its native status. Its area of occupancy in England is taken to have declined by as much as 84% in comparing records for the periods 1930-69 and 1987-99. In Kent, the historic native sites all appear to have gone and there are only six current or recent stations for the species, whose native or introduced status is considered below. In Kent, the species is **scarce**.

Account

The first published record for Kent is by Edward Jacob in his *Plantae Favershamienses* (1777) where he describes 'Penny-royal, or Pudding-grass' as *'In a small Pond at* Elvyland *in* Ospringe – *uncommon*'. This presumably relates to the Elverland estate, south west of Painter's Forstal. There were a few early records for damp areas on the acid soils of north west Kent, especially Chislehurst Common. For example, it was. recorded by Joseph Woods junior as 'very plentiful' in Turner and Dillwyn's *The Botanist's Guide through England and Wales*, 1805; and it was given by W.H. Griffin as still surviving in 1906 'in shallow pond on Chislehurst Com. but prob. less pl. than formerly', (*Woolwich Surveys*, 1909). Hanbury & Marshall (1899) assessed the species as rare, growing on 'Damp ground and pondsides, especially on heaths'.

Subsequently, there seems to have been little by way of record until the 1950s. In August 1952, D.P. Young recorded it at West Wood, Flimwell. This (TQ 722 306) appears to be more or less the site as for *Lobelia urens* (Heath Lobelia), in the administrative county of East Sussex. In September 1954, Francis Rose and David McClintock found it in an old gravel pit in Bigbury Wood, TQ 114 575, then reckoned to be the first occurrence of *Mentha pulegium* as a native plant in Kent for about 50 years.



Dartford. Photo by Roger Wright, 28 September 2011

Then there have been six more recent sites. The first of these is the record for north of Dartford, TQ57H, given in Philp (2010), following a visit in August 1999. This was pin-pointed more precisely by Margot Godfrey in September 2011 as at TQ 53756 75627, with plants growing at the base of a fence bordering on a footpath before it passes under the bridge by which the A206 is taken over the River Darent. They were associated with the banking which would have been constructed with the road c.1993. The likelihood is that Pennyroyal was introduced here as a grass seed contaminant when the road was originally laid out. In July 2015 it was still present, one patch c. 1 x 0.5m, with 20 spikes in bloom and many small ones coming through. The 1990s saw increased awareness generally of the presence of Pennyroyal in grass seed, and it was appearing in sowings in other parts of Great Britain at the time of the A206 laying out[411]. The site, although raised from the Darent floodplain, does not seem to be subject to seasonal inundation and otherwise lacks characteristics of native sites.

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[411] Kay, G.M. (1996). *Mentha pulegium* in grass seed. *BSBI News* **72**: 46.
Leach, S. (1996). Contaminants in grass seed. *BSBI News* **73**: 23-25.

Dartford. Photo by Chris Cook, 8 July 2015

The next site is Sevenoaks Wildlife Reserve where it was first seen[412] in 2002 as large patches on artificial islands which were constructed in the lake of the former gravel pit about five years previously, using spoil from in and around London. It looks as though seed could only have arrived with the spoil or subsequently via birds (when it would enjoy native status). In September 2008 Geoff Joyce found *Mentha pulegium* on the sandy margin of the east lake, at TQ 5244 5699. It was still present at the lake in October 2012, being scattered on the shore at TQ 5205 5683 with one plant at the eastern lake margin at TQ 52010 56846; it was also the dominant plant on man-made islands at TQ 5192 5684, accessed by dinghy. In 2020-24 it was found to be abundant about 85m south of the east lake, around TQ 52096 56727, where there is a triangle of open sandy/gravelly land with paths on two sides. This habitat appears to be dry in summer but in some degree winter-wet; it is semi-bare and the associated flora is a mixture of dry-tolerant species such as *Sedum acre* (Biting Stonecrop) and wetland species, e.g. *Juncus inflexus* (Hard Rush). Pennyroyal grows both in tramped, disturbed, marginal ground and also in less disturbed areas, so long as they are fairly open. It is possible that its presence here by the access from the anglers' car park derives from accidental introduction by anglers from the lakeside, but it was not observed growing at any of the anglers' stations, and may instead be related to general works on the reserve, or bird transmission from the lake margin.

It is not known that there is any particular association with sown grassland at the reserve. There are no obviously sown grass banks bounding the lakes from which Pennyroyal might have originated as a contaminant and thence spread along margins and islands. The most likely origin of the plant at Sevenoaks pre-2008 is by having been brought here by birds. Whilst this would amount to spread without human intervention, it is possible that birds could have brought it from a location to which it also been introduced by human intervention, such as Ardingly reservoir in East Sussex – in which case it could still not be regarded as native.

Sevenoaks. Photo by Geoffrey Kitchener, 1 July 2020.

The third site was for a casual record noted by Lliam Rooney in August 2017, when two plants were found growing from the kerbside of Arthur Salmon Close, Faversham at TR 0072 6112. These may have originated from cultivation.

The fourth site followed a report from Susan Sullivan and was found in July 2020 to comprise two patches of plants at Betteshanger, one at TR 34043 53225 consisting of about 100 flowering spikes towards the base of a colliery spoil slope and another at TR 34051 53215, a little lower down the slope and just outside the Sewage Works. The origin of these plants is unknown and bird introduction is credible; no seed sowing appears to have taken place in which Pennyroyal could have been a contaminant, but the colliery spoil substrate may offer good growing conditions comparable with the Sevenoaks sand/gravel. The area was subject to residential development following planning permission granted in May 2021.

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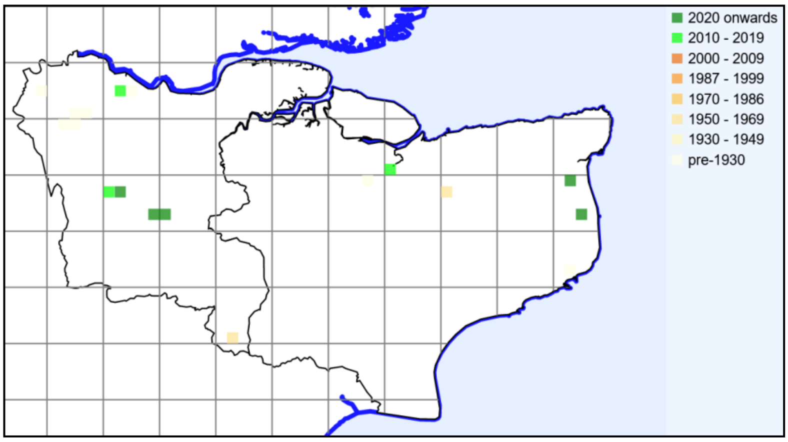
[412] Reported to BSBI database by J. Tyler; reported to LNHS by Geoff Joyce.

The fifth site was found by Ken Chapman and in July 2020 comprised a patch of plants in grassland at Monks Wall nature reserve, Sandwich, TR 32666 59319. The reserve was created from farmland in 2000 and any seeding then was applied to a neighbouring earth bank, and not the pasture below, where the Pennyroyal grows. It well fits the description in Stroh et al. (2019)[413] of typical habitat being 'damp seasonally inundated grassland overlying silt or clay...often within or on the margins of shallow ephemeral pools…and poached areas created by grazing animals'. The pasture is subject to some winter flooding and provides wintering ground for large numbers of lapwing and duck which again raises the issue as regards whether seed may arrive with birds. Seed can survive ingestion by animals; it is small and so could be transported in mud; it is retained in the calyx long enough for calyx hairs to form a means of attachment as they apparently do on wool, fur and other materials; and whether these means of transmission may be applicable to birds as well as animals is an open question, although accepted as possible by Stroh *et al.* (2019).

Habitat, Monks Wall reserve. Photo by Ken Chapman, July 2020

The sixth location was discovered by Alan Heyes in July 2021, one plant in flower growing at the base of a grass bank lining a farm lane near Plaxtol, TQ 5993 5368. Conclusions are not readily drawn from this, but it would most likely originate from seed contamination or as a garden escape. There is presumably a relationship with a find by Stephen Lemon in July 2023 of a small broken patch in flower in 'improved' parkland turf at Fairlawne, Plaxtol, TQ 60008 53455, less than 250m away.



***Mentha pulegium* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Introduced plants are often considered to be more erect (var. *erecta*) than the prostrate native (var. *decumbens*) and DNA sequencing has indicated that there is a genetic distinction (and that a hybrid population is also identifiable)[414]. Whilst the erect form has been associated with grass seed introductions, it may be simplistic to regard it as always non-native. Both forms were illustrated in English Botany[415] (var. *erecta* with stouter stems, not rooting at the nodes, with whorls more numerous and closer together, calyx-teeth longer and more acute) and var. *erecta* was said to have been collected in Ireland. Whilst it has always been the more usual form in cultivation, this does not preclude it from having had a wild origin; and Alex

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[413] Stroh, P. et al. (2019). *Grassland plants of the British and Irish Lowlands: ecology, threats and management*. Botanical Society of Britain and Ireland, Durham.

[414] Stroh, P.A. (2014). *Mentha pulegium* L., Pennyroyal. Species Account. Botanical Society of Britain and Ireland.

[415] (ed.) Syme, J.T.B. (1867). *English Botany*, vol 7, London.

Lockton[416] points out that Pennyroyal coming from North America, where it is not native, might well have been introduced there by early settlers and so would be returning to us.

Mentha pulegium is distinguishable from *Mentha aquatica* (Water Mint) through having a whorled inflorescence without a terminal head of flowers. In this it resembles *Mentha arvensis* (Corn Mint) and *Mentha* x *verticillata* (*M. aquatica x arvensis*); but it differs from those in having calyces with hairs in the throat and calyx-teeth of which the lower two are narrower and slightly longer than the upper three. Fertility is not necessarily a means of distinction from *Mentha* x *verticillata*, since that can sometimes assume a fertile form.

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[416] Lockton, A. (2002). A Pennyroyal Question. *BSBI News* **89**: 8-9.

Misopates orontium (L.) Raf. (Weasel's-snout)

vc 15 and 16

Rarity / scarcity status

Misopates orontium is an archaeophyte, or ancient introduction, which grows as a weed of cultivated ground in the British Isles, primarily in southern England and Wales. It has declined considerably, which has led to it being considered **Vulnerable** to the risk of extinction both in England and in Great Britain as a whole. Its area of occupancy in England is taken to have declined by 35% in comparing records for the periods 1930-69 and 1987-99. In Kent, the number of tetrad records has diminished by 71% in comparing the surveys of 1971-80 and 1990-2005 (Philp, 1982 and 2010), and it is currently **rare** (scarce, if sites of potentially recent introduction are included). It is a Kent axiophyte and so is regarded as an indicator of good habitat.

Upper Halling. Photo by Sheila Anderson, 4 August 2016.

Account

The first published notice of Weasel's-snout in Kent was by Thomas Johnson in his *Iter Plantarum* (1629), travelling by the main road from Gravesend to Rochester. He was also to record it in his *Descriptio Itineris* (1632), when making the journey in the reverse direction, from Canterbury to Gravesend via Sittingbourne and Rochester. Hanbury & Marshall (1899) regarded it as uncommon, though widely distributed in the county, in fields and garden ground. Where their cited records include habitat detail, it is generally said to have been growing in cornfields (Snodland, Luddenham, Maidstone), although also mentioned growing at cliffs between Sandgate and Folkestone, and on the walls of the old church at Margate. The *Woolwich Surveys* (1909) refer to it in cultivated fields at Hayes and West Wickham in 1897; seen once or twice in potato crops below Fox Hill, Keston in 1900; and as a garden weed near Hayes village in 1901. By the 1950s it was still being seen, and there is a sequence of records following the sands of the Folkestone Beds from near Harrietsham (weedy field, seen 1958 by Francis Rose with J.F. and P.C. Hall), through to Lenham Forstal (weedy cabbage field, seen 1958 by Francis Rose), to Hothfield (sand arable, seen 1954 by Francis Rose), to below Westwell (arable field on sand, seen 1958 by Eric Philp) and to Potters Corner (sandy verge of the A20, seen 1954 by Francis Rose).

The 1971-80 survey (Philp, 1982) picked up eight tetrad records, only three of which look as though they relate to the sands of the Folkestone Formation, and the rest are widely scattered. *Misopates orontium* was then considered rather rare, on cultivated or disturbed soil. During the 1991-2005 survey, however, it was only recorded from freshly disturbed roadside soil near Vintner's estate, Maidstone (2005) and on disturbed soil from the construction of the High Speed 1 rail route at Tutt Hill, Hothfield (the latter providing perhaps a degree of continuity from the 1950s records).

The position since then has been broadly similar, in that very little has been seen of the species (five tetrads, six monads, 2010-23), and its occurrences are disparate. An odd casual plant has been seen in a small front garden at Upper Sydenham in 2011, without any indication of origin. Plants appeared in Doddington allotments in 2014[417], apparently not deliberately introduced: the site was formerly arable on clay-with-flints, and it is possible that seed arrived with East Anglian onion sets; they have persisted from year to year (2020). However, a record for Shalmsford Street, south west of Canterbury, in July 2013 appears to represent a continuation of the species' classic arable status. Here some 40 to 50 plants were growing at an untreated corner of an arable field with scattered plants along the field margin. In contrast to the usual sandy substrate, this population was on a light soil over chalk and was accompanied by other arable weed species such as *Lysimachia arvensis* (Scarlet Pimpernel), *Euphorbia helioscopia* (Sun Spurge), *Fumaria officinalis* (Common Fumitory) and *Viola arvensis* (Field Pansy). Subsequent recording (to 2021) has shown it to be scattered in other fields in the area. A further quasi-arable site was discovered by Sheila Anderson in August 2016, in a field near Upper Halling which is often ploughed out of season and left to seed for pheasants; and another allotment site, at Wye, was reported in 2022.

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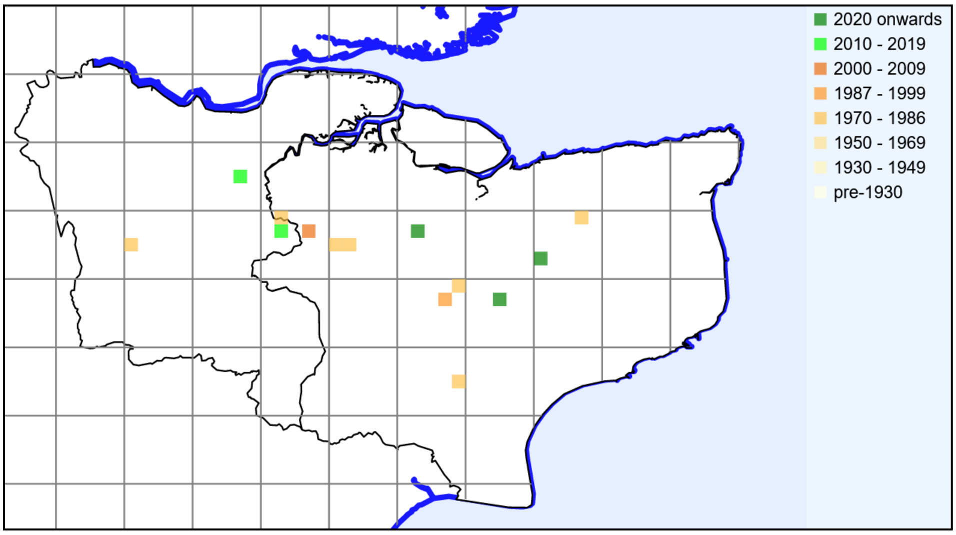
[417] Moyse, Richard (2015). Weasel's-snout as an allotment weed. *The Newsletter of The Kent Field Club* **81**: 23-24.

***Misopates orontium* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Misopates orontium is a spring-germinating annual and the trend towards autumn sowing of crops, together with agricultural intensification, has been considered contributory towards its decline. Where introduced into a garden at Halstead (TQ4861, not given in table below) in the late 1990s it has been found (up to 2023, and despite weeding out in the interim) to continue germinating well into summer, developing fruit into autumn, and (unless controlled) able to dominate open ground, spreading over 50m from its original location. What initially appears to be quite an attractive small pink snapdragon, in the later stages of development becomes more coarse and wiry, interlacing over large areas.

Halstead. Photo by Lliam Rooney, 18 June 2011

The name Weasel's-snout (from the appearance of the green hairy fruits) is relatively modern in its application to *Misopates orontium* and is not particularly Kentish. Indeed, in Kent it has been applied to *Linaria vulgaris*[418], although the more general English application in the 19th century was to *Lamiastrum galeobdolon* (Yellow Archangel)[419]. *Misopates orontium* is not readily confused with other species in Britain except, perhaps, for *Misopates calycinum* (Pale Weasel's-snout), which has a paler flower, is a bird-seed alien and has not been recorded in Kent.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Upper Sydenham (metropolitan vc16)	TQ3472		17 September 2011	MC	Fransfield Grove, one plant, appearing casual in one of the few

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[418] Parish, W.D. & Shaw, W.F. (1887). *A Dictionary of the Kentish Dialect and Provincialisms in use in the County of Kent*. London (English Dialect Society).

[419] 'Yellow weasel-snout' in Pratt, A. (1873). *The flowering plants, grasses, sedges, and ferns of Great Britain,* vol. 4. London. 'Weasel-snout' in Cowell, M.H. (1839). *A Floral Guide for East Kent, etc*. Faversham.

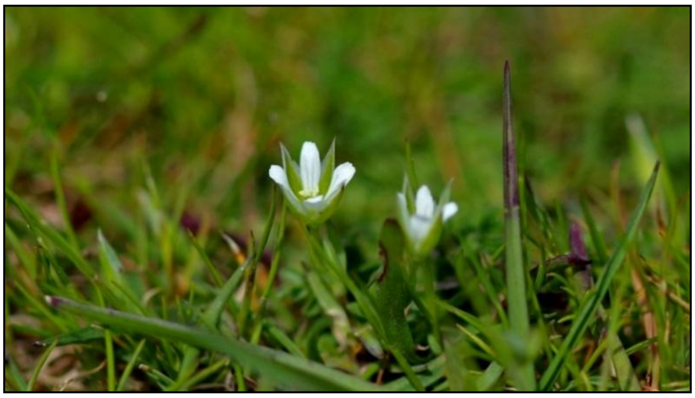
					small front gardens which held soil rather than hardstanding.
South Norwood Country Park (metropolitan vc16)	TQ3568		1997	JBed	With other cornfield species, apparently introduced for habitat creation.
Bexley (metropolitan vc16)	TQ47W		2 July 2001	DN	Parkhill Road, in garden, but later weeded out.
West Sevenoaks	TQ55C		After 1970, before 1981	Philp (1982)	
Great Buckland / Upper Halling	TQ6764		4 August 2016	SA	Near North Downs Way through field between Ten Acres wood (south) and Horseholders Wood (north), often ploughed out of season and left to seed for pheasants.
Northfleet	TQ67G		After 1970, before 1981	Philp (1982)	
Barming	TQ7356		9 September 2016	BW	Ground disturbed by works.
Aylesford	TQ75J		After 1970, before 1981	Philp (1982)	
Maidstone	TQ75T		27 July 2005	EGP & BW (Philp, 2010)	Freshly disturbed roadside soil near Vintner's estate.
Bearsted	TQ85C		After 1970, before 1981	Philp (1982)	
Hollingbourne	TQ85H		After 1970, before 1981	Philp (1982)	
South east of Shadoxhurst	TQ93X		After 1970, before 1981	Philp (1982)	
Tutt Hill	TQ94T		1999	EGP (Philp, 2010)	On disturbed soil from the construction of the High Speed 1 rail route.
Dunn Street, Westwell	TQ94Z		After 1970, before 1981	Philp (1982)	
Doddington	TQ9357		2014	RM	Allotments, apparently not deliberately introduced. [Still present, 2020, RM.]
Wye	TR0546		19 June 2022	DCh	TR 05747 46899. Two plants on allotments.
Shalmsford Street	TR1053, TR1153	Private farmland subject to High Level Stewardship scheme	(1) 15 July 2021 (2) 29 June 2018 (3) 17 July 2017 (4) 2 July 2016 (5) 29 July 2013	(1) AW (2) & (3) DCh (4) SC & ML (5) SB	(1) (a) TR 112 535, in arable. (b) TR 107 533, in arable, a single plant. (2) TR 10824 53418, spreading onto new set aside area north of previous area (3) TR 10757 53276. (4) TR 1029 5365, c.100 plants in rape field corner. Also TR 106535, scattering of c. 100 plants along field margin and maybe 40 plants in arable reversion. (5) 40-50 plants mostly at TR 07 534, at untreated corner of arable field alongside public footpath across private farmland; plus scattered plants along field margin. Light soil over chalk; associated species *Lysimachia arvensis, Euphorbia helioscopia, Viola arvensis* and *Fumaria officinalis*.
north east Canterbury	TR15U		After 1970, before 1981	Philp (1982)	
Fordwich	TR1859		7 October 2009	CO	4 plants at TR 185 597 in newly disturbed soil amongst new planting of trees for nursery production. Up to 40cm high, 8-11 flowers each. Not seen there by recorder before or since.

Moenchia erecta (L.) P.Gaertn., B. Mey. & Scherb. (Upright Chickweed)

vc 15 and 16

Rarity / scarcity status

Moenchia erecta is a plant of semi-bare or short-turfed sandy or gravelly places, local in England and Wales. Its conservation threat status in Great Britain as a whole is regarded as of 'Least Concern', but in England it is **Vulnerable** to the risk of extinction. Its area of occupancy in England is taken to have declined by 47% in comparing records for the periods 1930-69 and 1987-99. In Kent, there has been a decline of 25% in the number of tetrad records, comparing the surveys of 1971-80 and 1991-2005. Whilst far from common, it does not qualify as rare or scarce within the county. It is a Kent axiophyte and so is regarded as an indicator of good habitat.



Dartford Heath. Photo by David Steere, 6 May 2016

Account

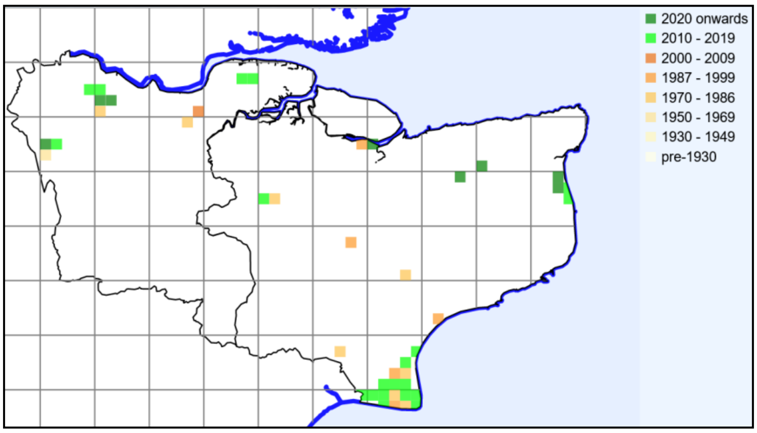
In Kent, the first published record for Upright Chickweed is that given in John Ray's *Synopsis Methodica Stirpium Britannicarum* (1724, edited by Dillenius), where the least Stich-wort is said to be 'Common in the Spring on *Black-heath*'. The other north west Kent heaths and commons also provided early records, with nineteenth century sightings on the sands and gravels of Chislehurst Common, Hayes Common, Paul's Cray Common and Dartford Heath. Hanbury & Marshall (1899) treated it as a local plant of dry banks and sandy heaths. They received a pre-1892 report of its presence at Tunbridge Wells Common but apart from this and the north west Kent records, the distribution which they identified was essentially coastal. This included records for the sandhills between Deal and Sandwich; and a scattering along the south east coast - sandy ground at Sandgate, between Dymchurch and Hythe, and an abundance of plants on the sandhills at New Romney. Curiously, *Moenchia erecta* at Dungeness is not mentioned, but it will surely have been present. Also not mentioned is a distribution located by Francis Rose along the sands of the Folkestone Formation from Ryarsh (The Roughetts, short turf on sand, 1945-55); to Ashford Warren (1960); thence to Hothfield (short dry turf on sand, 1952); and as far as Mersham le Hatch (dry turf on sandy soil, 1960).

Dartford Heath. Photo by David Steere, 6 May 2016

It seems likely that the broad county distribution found in 1971-80 (Philp, 1982) did not show the species as being much scarcer than in previous times (although it excluded metropolitan vc16, where much of the commons had become tree covered, albeit that there was still a presence at Keston Common war memorial area, where known at least since 1946). It was present in 25 tetrads and considered to be rather local on dry banks, sandy heaths and sand dunes, although particularly frequent over the shingle areas near Dungeness.

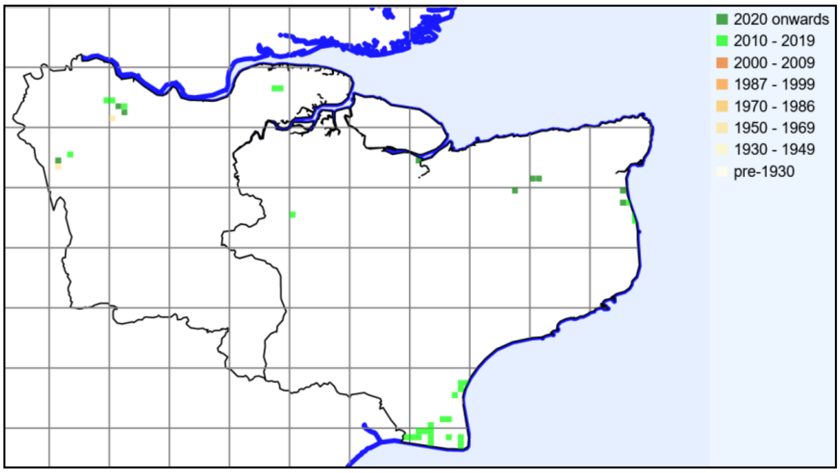
Habitat, Dartford Heath. Photo by David Steere,
6 May 2016

Whilst the distribution given in Philp (2010) had reduced to 20 tetrads, the overall pattern remained fairly similar, although with a reduced number of sightings in the Dungeness and Dartford Heath areas. It is possible that some of these changes do not reflect loss, but rather the ease with which such an inconspicuous plant may be overlooked. Records for 2010-24 map exceed the earlier total, with 28 tetrads (38 monads) and these are generally in fairly similar locations, although metropolitan West Kent is covered, which Eric Philp's surveys omitted. What might appear to be a geologically unexpected site at Stodmarsh (TR2161) actually relates to the plant's presence (along 40m of track) on deposited former colliery spoil.



Moenchia erecta **Kent records to 2024 mapped at tetrad level, from BSBI database.**

The accompanying distribution map at tetrad level shows losses of inland records following the line of Folkestone Formation sands across East Kent. The current position is shown at higher resolution in the monad map below; it lacks older records as monad recording only became the norm in Kent from 2010.



Moenchia erecta **Kent records to 2024 mapped at monad level, from BSBI database.**

Moenchia erecta is an annual, relying on a degree of open ground for continued establishment, and usually germinating in spring. The openness of the terrain may be maintained by shallow soils and summer drought affecting vegetation on sharp-draining sand, gravel or consolidated shingle; the plant flowers early, beginning in April, setting seed and dying by mid-summer. It is a short species, growing from 3-12cm and generally in the lower part of that range; it would appear to dislike competition, and the turf within which it grows is always short, whether through the hostility of the substrate, through exposure to coastal winds, through grazing or (as at Keston war memorial and at Rugby Portobello trust lands at St Mary's Bay) mowing. Its national distribution has diminished through the reduction of grazing on lowland heaths and commons[420]; this may not have affected Kent so much, in view of its limited heathland habitat. However, if the increasing fashionabiliy of 'no mow' treatment of grassland continues, there may be potential for impact.

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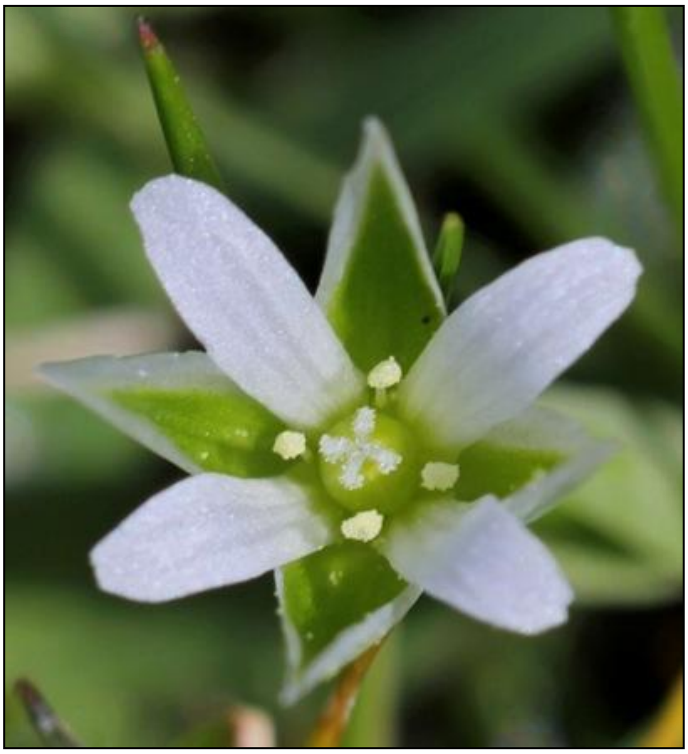
[420] Chatters, C. (1994). *Moenchia erecta* (L.) Gaertner, Meyer and Scherb., in (eds.) Stewart A., Pearman, D.A. & Preston, C.D. Scarce Plants in Britain, JNCC.

As the flowers are usually closed except in bright sunlight, the plant is often inconspicuous growing in turf of its own height. The waxy grey flower buds may with practice be picked out, including when growing with *Cerastium* and *Sagina* spp, for example on the consolidated shingle of Dungeness.



Dartford Heath. Photo by David Steere, 4 May 2018

Myosotis secunda Al. Murray (Creeping Forget-me-not)

vc 15 and 16

Rarity / scarcity status

Myosotis secunda is a plant of wet or boggy places, common in much of the British Isles but rare or absent in central and eastern England. Its conservation status in Great Britain as a whole and in England is of 'Least Concern', but it is **scarce i**n Kent. It is a Kent axiophyte and so is regarded as an indicator of good habitat.

Hothfield. Photos by Lliam Rooney, 19 May 2011

Account

The first published record for Kent is noted in W.J. Hooker's *Supplement to the English Botany*, vol. 2, 1834[421], which used the name *Myosotis repens,* of which the author was George Don. His younger brother, David Don, is credited in the *Supplement* as finding the species in Kent, and presumably this resulted in the 1831 specimen from Keston Common which found its way to **BM**. Victorian botanists were not always sure about separating this species from *Myosotis palustris* (now *M. scorpioides*, Water Forget-me-not), so the assessment by Hanbury & Marshall (1899) was that it was 'likely to prove not uncommon... though local' in wet places, especially on heaths and in wealden copses. They credit a record by the Rev. H.A. Stowell published in 1857 under the heading *Plantae rariores Favershamienses*[422] for marshes-dykes near Graveney and about Uplees, which sounds very much like *Myosotis laxa* (Tufted Forget-me-not) instead, but otherwise the records are for the most part Wealden.

Similarly, Francis Rose's searches in the 1940s and 1950s produced records at East Peckham (pond east of Hale Street, 1956); Chittenden Wood (small bog valley, 1944); west of Moorden, Penshurst (marshy valley, 1944, 1949); west of Ellis Wood, Lamberhurst (boggy field, 1946; this has since been dammed and is a lake); Bedgebury upper lake (1946); and Angley Wood (fen by Tuckers Pond, 1955). He also found it in sites more related to the sands of the Folkestone Formation than to the Weald – in the valley bogs at Hothfield and Gibbin's Brook, in both of which locations it still continues. In the 1971-80 survey (Philp, 1982), it was regarded as rather local and uncommon in Kent in wet peaty places, with nine tetrad records. By the 1991-2005 survey (Philp, 2010), however, tetrad records had dropped to five, and only three of these were the same as those in the earlier survey.

Records for 2010-24 comprise ten tetrad records, which would restore 1971-80 levels, but these are not all for the same sites as before. Indeed, what is noticeable in the following distribution map is the extent of apparent losses in the West Kent Weald. It is not obvious why this should be the case and it may be an artefact of recording.

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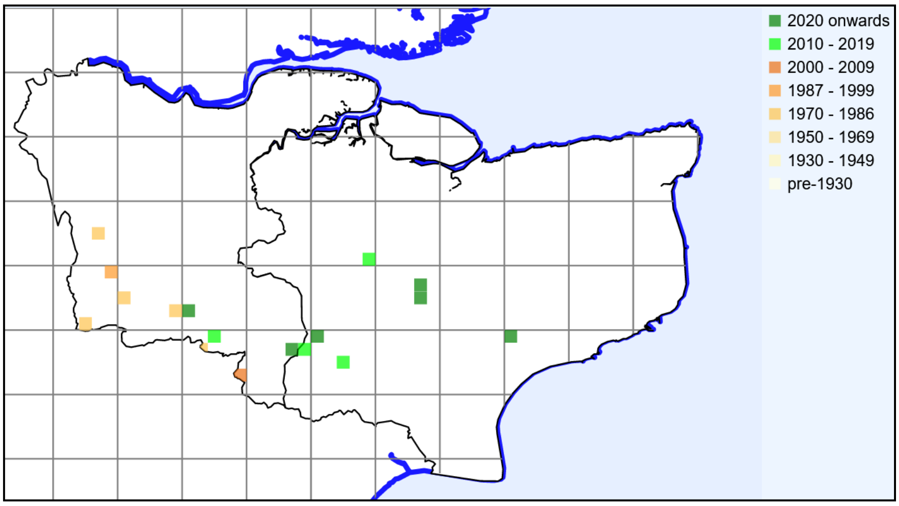
[421] Not 1837 as given in Hanbury & Marshall (1899).

[422] *The Phytologist* (1857-8) Vol. 2 N.S, p.153.

***Myosotis secunda* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Myosotis secunda can be annual or more long lived. It prefers wet acid peaty soils, through which its stolons will spread. Francis Rose described its associates at Hothfield as including *Lysimachia tenella* (Bog Pimpernel) and *Galium palustre* (Marsh-bedstraw)[423]; and at Decoy Pond, Pembury Walks, it grows with *Potamogeton polygonifolius* (Bog Pondweed).

It may be distinguished from other Kent Forget-me-nots found in damp habitats by the combination of appressed calyx hairs; style shorter than the calyx tube at flowering; calyx with narrow teeth having a base shorter than the sides; and lower part of the stem with projecting hairs.

Site	Grid reference	Site status	Last record date	Recorder	Comments
South west of Cowden	TQ43P		After 1970, before 1981	Philp (1982)	Presumably the Kent Brook valley; very little of this tetrad is in vc16.
West of Cowden	TQ44K		After 1970, before 1981	Philp (1982)	
Near Bough Beech reservoir	TQ44Z		(1) 1991-99 (2 After 1970, before 1981	(1) EGP (Philp, 2010) (2) Philp (1982)	
Brasted	TQ45S		After 1970, before 1981	Philp (1982)	
Chiddingstone Hoath	TQ5141		(1) 28 June 2006 (2) 1989	(1) & (2) JP	(1) & (2) Tubbs Hole Pastures, TQ 517 415.
North east of Penshurst	TQ54C		After 1970, before 1981	Philp (1982)	Probably west of Moorden, where recorded by FR in 1944, 1949.
Southborough	TQ54W		After 1970, before 1981	Philp (1982)	
Pembury Walks	TQ6142	RSPB reserve	(1) 30 May 2020	(1) SL	(1) Pembury Walks, Decoy Pond,

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[423] Rose, F. (1949). A Bryophyte Flora of Kent 1, *Transactions of the British Bryological Society* **1(3)**: 202-210.

			(2) 26 June 2019	(2) MA	TQ 6192 4239. Frequent around shady edge with *Potamogeton polygonifolius*. (2) TQ 61920 42389 Decoy Pond margins.
Near Bayham	TQ63I		After 1970, before 1981	Philp (1982)	
Great Sandhurst Wood	TQ63P		21 June 2013	MB and others	TQ63P.
Chingley Wood, Bewl Water	TQ63W		4 June 2001	EGP	
Angley Wood, Cranbrook	TQ7636		26 June 2022	SL	Angley Wood, Tucker's Pond, TQ 7646 3684. In shady alder carr.
Sissinghurst	TQ7937	Access land	26 May 2015	GK	TQ 7974 3797, patch in boggy glade of Bull Wood.
Sissinghurst	TQ83E	SSS	(1) 15 August 2012 (2) 1991-99	(1) KBRG meeting, det.SB (2) EGP Philp (2010)	(1) Patch at TQ 80095 38684 in mud 2 x 1 metres along small stream under sweet chestnut coppice in private woodland. (2) Roundshill Park Wood.
Little Bishopsden	TQ8435		2 July 2018	SB	A single plant beside a small stream at TQ 8457 3531
South east of Sandway	TQ8950		12 October 2011	BW	
Hothfield	TQ94S and TQ94T	KWT managed reserve and SSSI	(1)23 June 2022 (2) 19 May 2011 (3) 25 May 2010 (4) 1991-99 (5) After 1970, before 1981	(1) AL (2) LR (3) GK (4) EGP (Philp, 2010) (5) Philp (1982)	(1) TQ 968 456. (2) TQ9646 (3) TQ9646,in northern bog (4) & (5) TQ94S and TQ94T.
Gibbin’s Brook	TR1138	SSSI	(1) 6 June 2020 (2) 30 June 2013	(1) SL (2) KBRG meeting	(1) Gibbin's Brook, north-east of Sellindge, TR 1161 3856. Shrinking areas of open base rich fen formed over peat in area south of pond, now ungrazed, going rank and scrubbing over. Single patch in semi-shaded area. (2) In bog south of road crossing Gibbin's Brook, small patch at TR 11594 38586, and a larger one *c.* TR 1158 3851. Known at this site by FR, 1954.

Myosurus minimus L. (Mousetail)

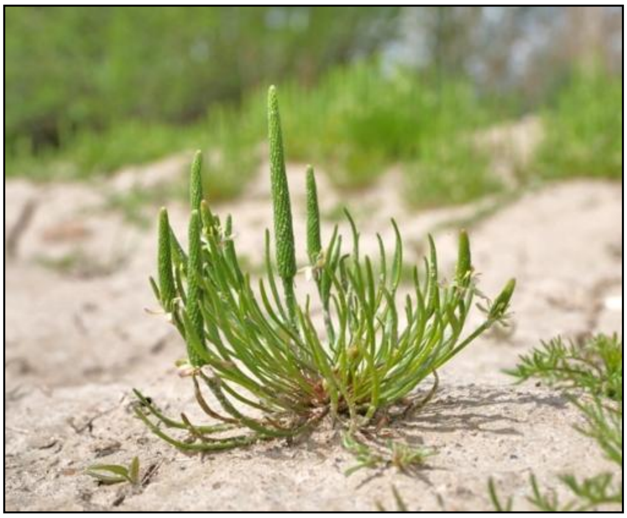
vc 15 and 16

Rarity / scarcity status

Myosurus minimus is an inconspicuous weed of damp arable or otherwise disturbed ground, adapted to seasonal water-logging, whose British distribution is largely confined to south east England, being absent from Ireland and almost so from Scotland. It is regarded as **Vulnerable** to the risk of extinction, both in England and Great Britain as a whole, as the extent of its occurrence in England is taken to have declined by 33% in comparing records for the periods 1930-69 and 1987-99. It was regarded as probably extinct in Kent after last having been seen in 1975, but was placed in this register upon its discovery at the Hoo peninsula in 2021 following which, in 2023, it was found to be still present in the area of the 1975 record, although by then apparently gone from the Hoo site.. It is accordingly very **rare** in the county. It is a Kent axiophyte, an indicator of good habitat.

Account

The first Kent record for Mousetail is by John Ray in his *Catalogus Plantarum Angliae* (1670), '*In the high-ways between Deptford and Eltham'*. It continued to be noted in that area, James Sherard having contributed a record to the third edition of Ray's *Synopsis Methodica Stirpium Britannicarum* (ed. Dillenius, 1724) 'On *Weston-green* a little on this Side *Eltham*, abundantly' (now Eltham Green), and a specimen having been collected by W.W. Reeves (d.1892) between Blackheath and Eltham, according to Hanbury & Marshall (1899). The latter authors regarded it as a plant of cultivated land, local and uncertain in its appearance, usually in cornfields and rarely in meadows. They cited reports of it as fairly widespread across the county, e.g. at Shorne[424]; Trottiscliffe; Rochester; Tunbridge Wells area[425]; Lower Rainham[426]; fields about Sittingbourne; Faversham[427]; Westwood Green, Thanet; Cheriton and Coolinge (Folkestone) as well as being common in the cornfields of East Kent on the Greensand[428]. The last dated West Kent record is given as May 1873 in the BSBI database (F.M. Payne at Bromley).[429]



Hoo St. Werburgh. Photo by David Steere, 12 May 2021

The relative frequency of pre-1900 records (although it was never a common plant) contrasts with the very limited number of sightings since. Francis Rose, in his MS *Flora of Kent*, considered it as a native of damp arable fields, mostly on sandy soils and damp sandy or loamy banks near the sea; formerly widespread and locally frequent along the north Kent coastal plain, but by the 1960s extremely rare. He could only point to recent finds in a sandy arable field at Fordwich (1950-51); in a deep sandy dune hollow at Sandwich (1960, unconfirmed) and at Sellindge (c.1954, unconfirmed). Philp (2010) refers to a record by J. Kesby (1975) at the edge of an arable field near Chesterfield, TR16H (Chestfield near Whitstable must have been intended). This was the last Kent sighting for over 45 years.

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[424] Robert Pocock's diary for May 1822, 'Friday, 3rd. – Walked down the sea wall to Shorne Battery, and found mousetail in bloom' (G.M. Arnold (1883), *Robert Pocock, the Gravesend Historian, Naturalist, Antiquarian, Botanist, and Printer*).

[425] In cornfields, not uncommon (T.F. Forster (1816), *Flora Tonbrigensis*).

[426] In cultivated fields, reported by F.M. Webb (d. 1880).

[427] Fields near Bysing Wood (M.H. Cowell (1839), *A Floral Guide for East Kent, etc*.). Cornfields on the gravel, chiefly about Luddenham and Oare (recorded 1854-55, Rev. H.A. Stowell; in *Phytologist* (1855-56) **1**: 375.

[428] G.E. Smith (1829), *A Catalogue of Rare or Remarkable Phaenogamous Plants, collected in South Kent.*

[429] There is some doubt about this, which is attributed to a specimen at Leeds City Museum. There is material, at South London Botanical Institute labelled by R[ichard] Payne from Bromley and dated May 1871, which suggests the possibility of confusion.

Habitat, Hoo St. Werburgh. Photo by David Steere, 12 May 2021

On 9 May 2021, however, Mousetail was discovered and reported by Jane Lawson near Hoo St. Werburgh. Visits by various botanists shortly afterwards assessed the population as c.22,500 plants present at the unploughed margins of an arable field southeast of Abbots Court on alluvium at an elevation of about 2m and some 250m from the Medway estuary. Plants were recorded in the field's northwest corner, e.g. at TQ 79547 71989, and then in a broad band 4m wide (some plants extending to 6m out) along the margin northeastwards from TQ 79555 72006 to TQ 79614 72050, but thinning out towards the end; with only occasional plants at the edge for another 30m. Local enquiries indicated that this corner of the field had been subject to flooding in the previous winter such that an adjoining footpath had been cut off, and the farmer had been unable to complete the 2021 ploughing[430]. These circumstances had provided a swathe of land which had evidently been ploughed in late 2020, but had received no cultivation afterwards and germination of potentially competitive species had been inhibited by flooding. Neighbours had not observed Mousetail there before, but the presence of the broad band parallel to the field margin suggests that plants may have been present at the margin previously, and the seed, which floats, had been washed out with the winter floodwaters.

Associated species received only a limited assessment in May for, while Mousetail was in full flower, arable weeds in the vicinity were small and very little advanced, with germination having been held back by earlier inundation. Noted were: *Anagallis arvensis* (Scarlet Pimpernel), *Epilobium* spp. (Willowherbs), *Juncus bufonius sens. lat*.(Toad Rush), *Thlaspi arvense* (Field Penny-cress), *Ranunculus sardous* (Hairy Buttercup), *Ranunculus sceleratus* (Celery-leaved Buttercup), *Tripleurospermum inodorum* (Scentless Mayweed). A further survey in August 2021, at which time Mousetail was no longer visible, was more informative as regards associates. In addition to the above species, there were: *Bidens tripartita* (Trifid Bur-marigold) and *Gnaphalium uliginosum* (Marsh Cudweed), both indicators of damp conditions; *Bromus secalinus* (Rye Brome) and *Polygonum rurivagum* (Cornfield Knotgrass), both county rare plant register species usually found with cereals; as well as more generalised arable weeds - *Atriplex prostrata* (Spear-leaved Orache), *Avena fatua* (Wild-oat), *Avena sativa* (Oat), *Chenopodium album* (Fat-hen), *Epilobium ciliatum* (American Willowherb), *Epilobium tetragonum* (Square-stalked Willowherb), *Erigeron canadensis* (Canadian Fleabane), *Erigeron sumatrensis* (Guernsey Fleabane), *Helminthotheca echioides* (Bristly Oxtongue), *Matricaria chamomilla* (Scented Mayweed), *Persicaria lapathifolia* (Pale Persicaria), *Persicaria maculosa* (Redshank), *Polygonum aviculare* (Knotgrass).

There are no previous records for this location, the nearest being a nineteenth century report from Rochester by Miss R.E. Wickham of Strood. Arrival through adhesion of seeds to birds' feet is a possible origin. A search on 15 May 2023, however, produced no plants at all. The site had evidently not been ploughed since 2020 and was grassing over (including by *Alopecurus geniculatus* (Marsh Foxtail), an indicator of damp conditions) with an increasingly perennial weed flora present. Gaps of bare soil were relatively few, and developing a moss cover. The absence of Mousetail even from those gaps suggests that not only is open ground following flooding required for germination and development, but also disturbance. Absence continued in 2024 (Judith Shorter).

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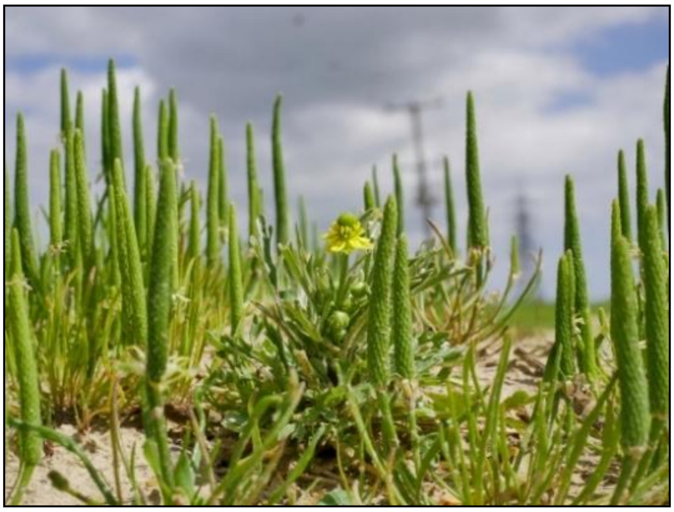
[430] Previous flooding is suggested by google earth historic aerial imagery, in particular from April 2015, which shows almost the exact boundary of the 2021 *Myosurus* colony as excluded from spring ploughing. This side of the field is adjoined by wet ground associated with fishing lakes resulting from gravel extraction in 1963. The extraction destroyed some historic ground features including former historic monument 1547411, part of sea defences interpreted as dating to the thirteenth century and protecting the Abbots Court moated site. It looks as though the *Myosurus* location is part of levels which were in mediaeval times outside the sea defences and open to the estuary, although the current Medway seawall now encloses them.

The occurrence of this colony in 2021 appears to be related to a set of fortuitous circumstances, but does raise the question of why Mousetail is in any event so rare. The Kent decline is also reflected in the national distribution, although the latter is evidenced from 1930 onwards, and Kent records appear to have trailed off well before the 1930s. The decline does not seem especially related to herbicide usage which has impacted on many other arable weeds, as this would be more relevant from the 1950s onwards, especially from the 1970s. In any event, it seems that, although herbicidal treatment slightly decreases seedling emergence in experimental conditions, it may not be as significant as the impact of the water regime.[431]. Nor is the decline related to seed cleaning, another source of arable weed decline: Mousetail seeds are scarcely likely to have been caught up in any harvesting from which crop seeds may have been taken. The British decline has been assigned to intensive arable and grassland management and the abandonment of extensive grazing of agriculturally marginal lowland grasslands, including commons, so that in the absence of grazing, vigorous grasses and herbs take over the fertile bare ground required by Mousetail.[432] This is persuasive as regards loss of suitable habitat where cessation of grazing is a factor, but does not wholly fit the Kent pattern.



Hoo St. Werburgh, *Myosurus minimus* with *Ranunculus sceleratus*, the latter also an indicator of damp ground. Photo by David Steere, 12 May 2021

Kent records may be considered as falling into two habitat categories[433], both artificial, and as Salisbury (1970)[434] pointed out, perhaps indicative of *Myosurus* being originally a colonist brought in by early agriculture. One such habitat is rutted ground of tracks and gateways where seasonally inundated and subject to trampling. Our first Kent record, on a seventeenth century highway near Eltham, was presumably of this nature; and the boggy trackways which characterised early roads provided suitable habitat before turnpike roads became extensive and surfaces were eventually tarmacadamised with associated highway drainage. The other, and most frequent, habitat in terms of pre-1899 records has been cornfields, presumably ill-drained ones. The extent of agricultural drainage improvements doubtless accounted for a degree of habitat loss, both during the nineteenth century, when *Myosurus* was still being found widely, but locally, within the county, and subsequently. But there are still arable fields with marginal flooding issues, so it is not as though suitable habitat does not exist. Possibly, the key to the decline lies in Hanbury and Marshall's words 'local and uncertain', i.e. the species has always been sufficiently local that any vicissitudes affecting its continuance at a particular site have resulted in its disappearance without neighbouring populations affording potential for recruitment; and uncertainty of occurrence relates to its being an annual, probably with exacting requirements for winter inundation.

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[431] Albrecht, H., Prestele, J., Altenfelder, S., Wiesinger, K. & Kollmann, J. (2014). New approaches to the conservation of rare arable plants in Germany. 26th German Conference on Weed Biology and Weed Control, March 11-13, 2014, Braunschweig, Germany, *Julius-Kühn-Archiv* **443.**

However, significant effects on plant density resulting from fertiliser and herbicide applications were reported by Altenfelder, S., Kollmann, J. & Albrecht, H. (2016). Effects of farming practice on populations of threatened amphibious plant species in temporarily flooded arable fields: implications for conservation management. *Agriculture, Ecosystems & Environment* **222**: 30-37.

[432] Chatters, C. (1994). *Myosurus minimus* L. Mousetail, in eds. Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough.

[433] We have not had experience of occurrence in urban habitats, such as has taken place in Northants and Bucks.

[434] Salisbury, E.J. (1970). The pioneer vegetation of exposed muds and its biological features. *Philosophical Transactions of the Royal Society of London, Series B, Biological Sciences*, **259**: 207-255.

There is, however, also the potential for a colony to be overlooked, which appears to have happened in the case of the Chestfield population, with a gap in records from 1975 to 2023. It seems, from anecdotal evidence, that the species was present in the interim, but unrecognised. On 1 May 2023, Alex Lockton found numerous plants at four locations with bare muddy patches near cattle troughs and gateways at some silage fields. Sue Buckingham provided a population estimate of several thousand plants together with more data in relation to those finds:

(1) TR 1281 6539, by a cattle water trough, 1,000 (estimated) plants spread densely over an area c. 4m x 1.5m with a mix of sizeable flowering plants and clusters of non-flowering ones of varying size. Associated species: *Lepidium didymum* (Lesser Swine-cress), *Matricaria discoidea* (Pineappleweed), *Poa annua* (Annual Meadow-grass), *Senecio vulgaris* (Groundsel).

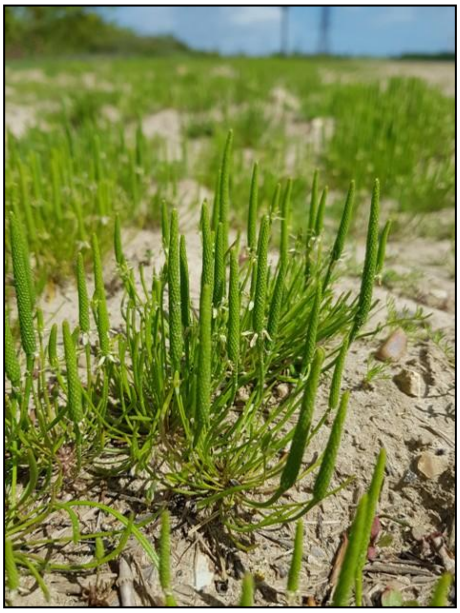
(2) TR 1252 6533, an area of c. 2m x 1.5m beside a different water trough with similar spread *of M minimus* plants and associates.

(3 TR 1250 6520, beside a gateway, an area of cracked bare mud c. 30m x 30m with widely scattered plants of all sizes.

(4) TR 1242 6509, by gateway from cattle barn, an area of cracked bare mud c. 20m x 20m also with widely scattered plants.

Whether any overlooking is entailed in a May 2024 sighting by Martin Hall of a single plant between Old Wives Lees and South Street is an open question. It was found on disturbed ground in an orchard at TR 06122 56732 and, as yet, has not been tied into any wider occurrence in the neighbourhood.

Myosurus minimus seeds appear not to germinate before mid-December, and do so once winter flooding has receded. The plant's growth strategy is one of avoidance of competition, in view of its low height and limited leaf surface. Normally growing on land which has no competitive vegetation present at the outset, through cultivation or other disturbance and then flooding, it retains that advantage by near-simultaneous germination of most seeds[435], rapid growth and early flowering (from March onwards) leading to seed-shed in June and July. Salisbury (1970) noted young seedlings' development of a skirt of root-hairs which provide anchorage and stability, which is especially important when rain liquefies the surrounding exposed mud. The ability of the germinating seeds to produce markedly extended seedlings in the dark (although the triggering of germination normally requires light) suggests that this capacity for elongation may also serve if shallow water still remains when growth commences.



Hoo St. Werburgh. Photo by Sue Buckingham, 12 May 2021

The elongation of the receptacle in fruit (the mouse's tail), up to 50mm, is a separate issue, and seed output of a receptacle has been assessed at a mean of 231 in plants at the Ouse Washes, Cambridgeshire[436]. Salisbury (1970) found an average seed output of 1,040 ± 40 per plant, with the largest plant observed having an estimated output of 3,100. If the average is applicable to the Hoo peninsula population in 2021, this suggests an output of 23.4 million seeds. Mousetail is capable of building up a substantial seed-bank in the soil: an especially weedy British field has been found to carry seven million viable Mousetail seeds in the top six inches of soil[437].

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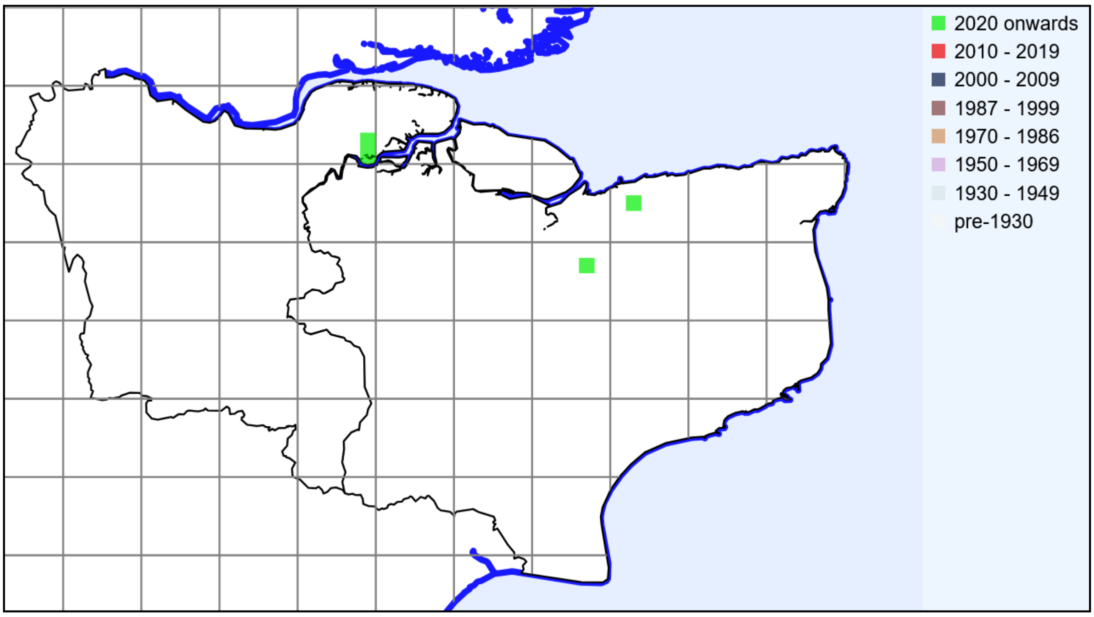
[435] Nearly 70% of seeds germinated within four days of the first appearance of a seedling, in experimental cultivation recorded by Salisbury (1970). This paper also cites work which resulted in nearly 70% germination within eight days, with 0.5% continuing to germinate after more than three years.

[436] Cadbury, C.J. (1973). Mousetail, *Myosurus minimus*, L. at the Ouse Washes. *Nature in Cambridgeshire* **16**: 37-39.

Mousetail may readily be overlooked, by virtue of its small size and inconspicuous flowering, unless present in quantity. It is unlikely to be confused with any other British plant, although the fruiting heads bear a passing resemblance to a small plantain. It is a member of Ranunculaceae (the Buttercup family), and there is a case for its inclusion in *Ranunculus* – it was named *Ranunculus minimus* in 1901, but this is not usually followed in Floras.

Hoo St. Werburgh. Photo by
David Steere, 12 May 2021

Myosurus minimus **Kent records to 2024 mapped at tetrad level, from BSBI database.**



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[437] Roberts, H.A. & Stokes, F.G. (1966). Studies on the weeds of vegetable crops. VI. Seed populations of soil under commercial cropping. *Journal of Applied Ecology* **3**: 181-190.

Myrica gale L. (Bog-myrtle)

vc 15, of questionable status; probably gone from vc 16

Rarity / scarcity status

Bog-myrtle is widespread in bogs and wet moorland or heathland across the British Isles, often abundant in the north west. This led to its conservation risk assessment as being of 'Least Concern' in Great Britain as a whole; but it is largely absent from central and south east England; and a decline in the area of its occupancy in England generally of 23%, comparing records for the periods 1930-69 and 1987-99, means that it is now considered to be **Near Threatened** in England. It was thought to be lost in Kent, where there is little suitable habitat anyway; but it is currently growing in one site and is very **rare.**

Hothfield. Photo by Lliam Rooney, 20 April 2011

Account

The species may well have featured in Kent under different climatic conditions. Possible (but unconfirmed) seeds were found amongst material from species of woodland and wetland – but apparently not bogland, which casts doubt on identification –deriving from borehole sampling (7080-6770 BC) from the Isle of Grain in 2006.[438] Bog-myrtle pollen has been found in peat deposits at Lydd between two and three thousand years ago, but this might be interpreted as originating from strong populations in the Walland Marsh area in Sussex.[439] However, peat formation in parts of Romney Marsh about four thousand years ago was associated with an acid flora including *Myrica gale*, at Brookland and Snargate[440], although there is no habitat continuity to the present. Twig fragments probably of this species have been found in late glacial deposits (10000-8800 BC) below Wye Downs.[441]

The first published notice of this species in the county was by John Parkinson in his *Theatrum Botanicum* (1640), who said that it 'groweth in many places of our owne Land... as in... Kent'. It was subsequently seen at Tunbridge Wells, a record given by the Rev. Thomas Martin in his *Plantae Cantabrigienses* (1763), although this might have been in Sussex, just as might have been Forster's record near a stream in the horseway from the Frant Road to Bayham Abbey, in great abundance (*Flora Tonbrigensis*, 1816) – the stream may have been the (vice) county boundary[442]. However, Hanbury & Marshall (1899), credit it to south west Kent, having received a report of sighting by G.B. Wollaston (1814-1899).

In east Kent, Edward Jacob (*Plantae Favershamienses*, 1777) recorded it as '*On* Willsborough Lees, *near* Ashford – *plentifull*y' and this is elaborated by Edward Hasted as in boggy ground joining to a small farm called Coombs-hole[443]. It was not noted there by G.E. Smith, who knew the area in the 1820s and 1830s, but he was selective in what he recorded. Jacob gave the English names of *Myrica* as including Sweet Willow, and ordnance survey maps from now at least back to 1871-2 show a Sweetwillow Wood at Willesborough, which presumably indicates where the plant used to grow.

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[438] Wessex Archaeology (2008). *BritNed Interconnector Isle of Grain Archaeological stage 3 sample assessment*. (accessed via Archaeology Data Service).

[439] Kirby, J., Clarke, D., Shaw, T. & Toole, E. (2010). The mid-late Holocene Evolution of Southern Walland Marsh and the origin of the 'Midley Sand'. In (eds.) Waller, M., Edwards, E. & Barber, L. *Romney Marsh: Persistence and Change in a Coastal Lowland.*

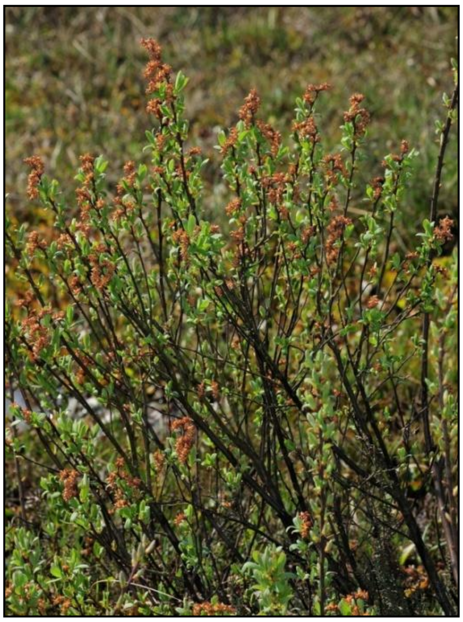
[440] Long, A., Waller, M., Hughes, P. & Spencer, C. (1998). The Holocene depositional history of Romney Marsh proper. In (eds.) Eddison,J., Gardiner, M. & Long, A. *Romney Marsh: Environmental Change and Human Occupation in a Coastal Lowland*.

[441] Levy, J.F. Appendix II, Woods and Charcoals, in Kerney, M.P. *et al.* (1964). The Late-Glacial and Post-Glacial History of the Chalk Escarpment near Brook, Kent. *Philosophical Transactions of the Royal Society of London, Series B, Biological Sciences* **248**: 135-204.

[442] A.H. Wolley-Dod (Flora of Sussex, 1937) , in giving this record for Sussex, speculated that it might be the same as a record on each side of the stream above Benhale [Benhall] Millpond, but this looks well distant.

[443] Edward Hasted (1798). *The History and Topographical Survey of the County of Kent: Vol. 7.* W Bristow, Canterbury.

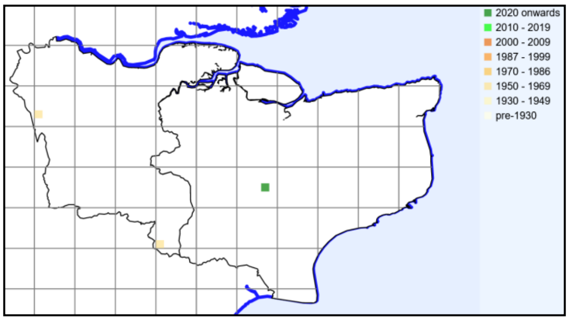
Hanbury & Marshall (1899) gave no other records, and regarded it as a very rare species of boggy heaths. It is surprising – as Rodney Burton points out in his *Flora of the London Area* (1983) that none of the older botanists commented on *Myrica gale* at Keston Bog. The earliest evidence for its presence there is 1920, the date of a specimen in **SLBI** collected by Marjorie Bostock, and apparently it did not last beyond 1957, probably due to tree growth overshading the bog and reducing water availability as well as increasing nutrients from dead leaves.



Hothfield. Photos by Lliam Rooney, 20 April 2011

There is a further West Kent (vc16) station, attested by a 1960 specimen in **MNE** gathered by Francis Rose. This is marked as from a wood west of Flimwell and south of the A21, in a boggy heathy area on Tunbridge Wells Sand 'now in E. Sussex'. The boundaries in this area have long given rise to complications, given that the vice county boundary is not in accord with the administrative county boundary, but this location (given as TQ 711 315 in a record by W.J. Davies in December 1957) would appear to be mature woodland through which the administrative county border runs (following the upper reaches of the River Bewl) but which is within vice county 16 (West Kent). It can no longer be found here.

The only current known Kent location is at Hothfield Common, where it was first recorded by a survey team on the KWT reserve in 2010. When revisited the next year, there was a sizeable patch, c.1.5 x 2m, with many dozens of stems derived from the species' suckering habit, located in the main bog, about $^1/_3$ of the way between the board walk at the top of the bog, and about 4-5m from the northern edge of the bog, TQ 9689 4569. Only male catkins were present so, as the species is normally (but not invariably) dioecious, this is probably a single clone. It remains present (2022).



***Myrica gale* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Whilst the habitat at Hothfield is entirely appropriate for this species, what is surprising is that it has escaped attention in such a well-botanised location until now. For much of the year it is not a particularly prominent plant, but in spring the red-brown buds and flowers are noticeable; and if it had been native here, one would have expected historic records. It is difficult to conceive how seed might have arrived in recent times, as it is normally spread by water from plants already present; but in any event, seedlings are supposed to be rare in the field.[444] The likelihood is that it has been planted, just as *Sarracenia purpurea* (Pitcherplant) was there in 1996, and *Pinguicula vulgaris* (Common Butterwort) in the 1940s.

Bog-myrtle is not readily confusable with other species, although from a distance, it may appear to be a young *Salix* bush.

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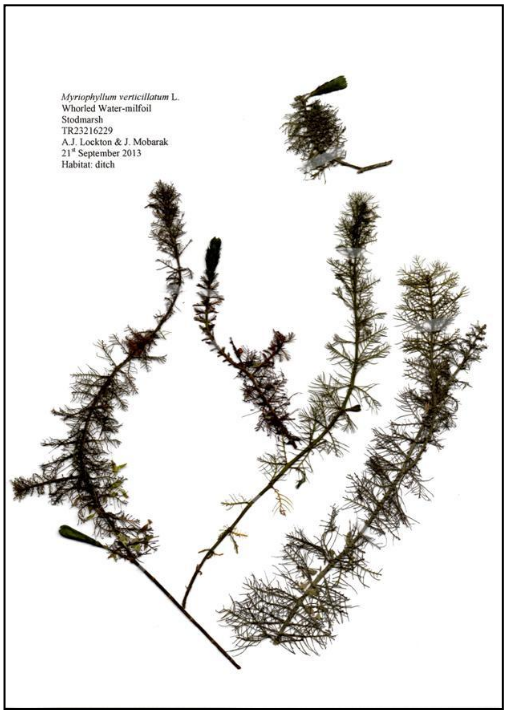
[444] Skene, K.R., Sprent, J.I., Raven, J.A. & Herdman, L. (2000). *Myrica gale* L., Biological Flora of the British Isles. Journal of Ecology 88: 1079-1094.

Myriophyllum verticillatum L. (Whorled Water-milfoil)

vc 15 and 16

Rarity / scarcity status

Myriophyllum verticillatum is an aquatic species scattered in England (mostly east), Wales and Ireland. Its conservation threat status in Great Britain as a whole is regarded as **Vulnerable** to the risk of extinction, but in England (where most populations lie) it is **Near Threatened**. Its area of occupancy in England is taken to have declined by 29% in comparing records for the periods 1930-69 and 1987-99. In Kent, there has been a decline of 67% in the number of tetrad records, comparing the surveys of 1971-80 and 1991-2005, but this may overstate the position. Its county status would be rare, if based on the records in Philp (2010), but enough is now known to treat it as **scarce**. It is a Kent axiophyte and so is regarded as an indicator of good habitat.



Stodmarsh, herbarium specimen, 2013, Alex Lockton & J. Mobarak

Account

The first publication of this species for Kent was in Edward Jacob's *Plantae Favershamienses* (1777), when he described it as '*In the ditches of* Graveney Marsh – *not uncommon*'. It may well have persisted in this area: Philp (1982) included a record for TR06B, which could have been either side of Faversham Creek. Hanbury & Marshall (1899) considered it to be local in ponds and ditches, with records ranging along the north of the county from Greenwich to Thanet, and in the Deal/Sandwich area; also a couple in the Weald, and a comment (1805) that it was plentiful in Romney Marsh. Francis Rose considered it to be 'very rare now' (MS *Flora of Kent*), but had seen it still in the Faversham area (in freshwater in a flooded gravel pit east of Oare Church, 1959) and in several places in the East Kent fens: Ham Fen (1991); fen dykes at Wickham Fen (1946) and east of Little Britton Farm (1947), and north east of Wickhambreaux. In the Weald, he knew it at Leigh Bridge near Headcorn in a pond on Weald clay (1949); in a similar pond 2 miles east of Frittenden (1954); in flowing water, River Sherway, Sherway Bridge north of Smarden (1982, 1984); and in an alluvial marsh dyke on the Sandhurst levels (1954).

Philp (1982) regarded the species as very scarce and decreasing, with nine tetrad records during 1971-80[445]. These had reduced to three in the 1991-2005 survey (Philp, 2010): Dartford Marshes (two tetrads) and Worth Marshes. However, it is worth noting that in 1982 and 2003 the Hacklinge Ditches Surveys (the latter commissioned by English Nature / Environment Agency) recorded *M. verticillatum* in numerous ditches in the Worth Minnis / Hacklinge / Lydden Valley area, with findings in eleven monads, so the single tetrad record there in Philp (2010) may not be fully representative[446]. However, whilst we have subsequent records for some of these monads, it would require another intensive survey over a large area to demonstrate that this sort of frequency continues.

Recording for 2010-24 has redressed some concerns regarding decline, in that the species is now known from ten tetrads (deriving from 12 monads). Presence at Dartford continues, in ditches not far from the R. Darent (continuity for which goes at least back to a specimen gathered by H. Lamb in 1898, in **MNE**). The East Kent fens and the related Stour valley area are represented by finds at Stodmarsh, Preston Marshes and Worth (thence south of Worth as far as Betteshanger Country Park); and knowledge of presence at the Sandhurst Levels (from the 1950s) has been re-established. The ditches of Stodmarsh SSSI received a particularly thorough survey in 2022, with 32 records made across three monads, Alex Lockton describing it as frequent throughout the national nature reserve, in ditches and pools[447].

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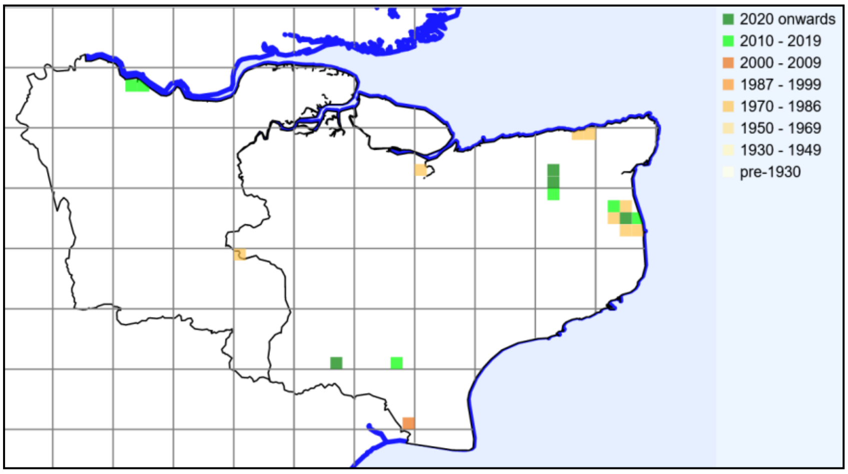
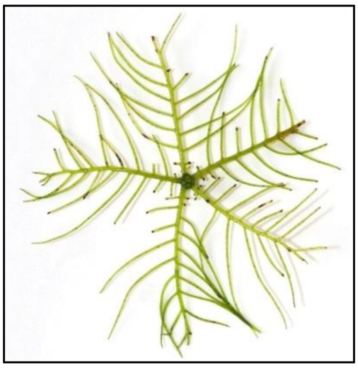
[445] These were for TQ74E, TQ57N, TQ93Q, TR06B, TR26F TR26U, TR26Z, TR35R, and TR35M (not given in the following data table).

[446] Indeed, Alex Lockton considers that *M. verticillatum* at Stodmarsh was likely to have been misidentified by Eric Philp as *Myriophyllum spicatum* (Spiked Water-milfoil) – *The Flora of Stodmarsh National Nature Reserve* (January 2017).

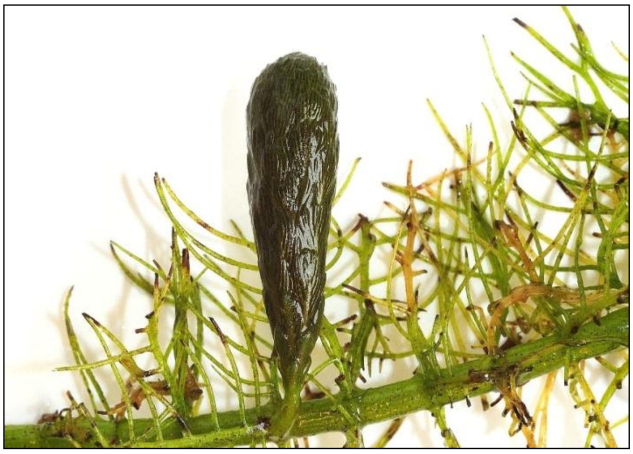


***Myriophyllum verticillatum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Myriophyllum verticillatum grows in both still and flowing waters, and so in Kent has been found in ditch, pond and river habitats, primarily in marsh dykes not far from coast or estuary. There appears to be some overlap between its ecological requirements and those of the much commoner *Myriophyllum spicatum* (Spiked Water-milfoil). Indeed, most of our current sites for *M. verticillatum* also have the commoner species in the same tetrad. *M. verticillatum* is supposed to have a preference for calcareous water, and this accounts for many of our East Kent records, but does not explain its presence in other non-calcareous habitats. *M. spicatum* is supposed to be found often in calcareous waters, but to grow in meso-eutrophic or eutrophic waters, and it may that it has a greater tolerance of the effects of nutrient run-off from land serving the water supply.



Stodmarsh. Photos by Lliam Rooney, 11 October 2013 (on the right is a turion).



The two species are separated by *M. verticillatum* having generally five leaves in a whorl, and *M. spicatum* having four, but there is some overlap. The uppermost bracts of *M. spicatum* are entire or just serrate; those of *M. verticillatum* are dissected or deeply serrate. The presence of turions – club-shaped shoots formed late in the year appressed to the stems, which are capable of detaching for dispersal and growth elsewhere – is diagnostic for *M. verticillatum.*

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Dartford Marshes	TQ5377, TQ5477		(1) 4 August 2016 (2) 12 August 1985 (3) 1971	(1) KBRG meeting (2) JP (3) JRP	(1) In TQ5377 and at in a ditch just outside shooting club car park TQ 5428 7714. (2) TQ545770. (3) TQ57N,dyke.
Stone Marshes	TQ57T		1972	JRP	
Friezingham	TQ8630		6 September 2020	SB & RL	Abundant in ditch alongside railway at TQ 8696 3090.

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[447] Lockton, A.J. (February 2023). The Flora of Stodmarsh National Nature Reserve.

Appledore Heath	TQ9630	SSSI	16 July 2015	KBRG meeting	Ditch at TQ 96743 30343 with *Utricularia australis*.
Teynham Marshes	TQ9664		1 August 1997	RM	TQ 968 645. Plants identified in a 50m stretch of watercourse, 25m each side of the intersection of the watercourse with a 100m OS gridline.
Teynham Marshes	TQ9763		1 August 1997	RM	TQ 972 639, TQ 975 636, TQ 977 637. Plants identified in a 50m stretch of watercourse, 25m each side of the intersection of the watercourse with a 100m OS gridline.
Teynham Marshes	TQ9764		1 August 1997	RM	TQ 972 640, TQ 975 647, TQ 977 642. Plants identified in a 50m stretch of watercourse, 25m each side of the intersection of the watercourse with a 100m OS gridline.
Teynham Marshes	TQ9964	SSSI	1 August 1997	RM	TQ 991 640. Plants identified in a 50m stretch of watercourse, 25m each side of the intersection of the watercourse with a 100m OS gridline.
Stodmarsh	TR2261	NNR, SSSI	(1)19 September 2022 (2) 2 September 2022 (3) 9 August 2022 (4) 11 July 2022 (5) 6 July 2022 (6) 5 July 2022 (7) 4 July 2022 (8) 1 July 2022 (9) 28 August 2021 (10) 20 August 2021 (11) 19 August 2021 (12) 12 August 2021 (13) 18 August 2018 (14) 1996	(1) AL (2) AL & BH (3) AL & KO (4) PW, PG-S & HS (5)VB-H, KF-S & DG-S (6) AL, HSt & KC (7) AL & KC (8) AL & KC (9) to (12) AL (13) KBRG /KFC meeting (14) PW	(1) TR 2270 6152, TR 2281 6150, TR 2279 6158, TR 2264 6173, TR 2269 6163, ditch survey. (2) TR 2262 6167, ditch survey. (3) TR 2257 6190, TR 2256 6198, ditch survey. (4) TR 2285 6151, ditch survey. (5) TR 2247 6122. (6) TR 2284 6190, TR 2277 6190, ditch survey. (7) TR 2295 6199, ditch with grazed margin; TR 2286 6199, ditch survey. (8) TR 2264 6207, ditch survey. (9) TR 2289 6196;TR 2295 6199, ditch with grazed margin, ditch survey; (10) TR 2277 6190 Cattle grazed ditch, no sign of *Azolla*. (11) TR 2264 6207. (12) TR 2286 6199, ditch with grazed margins; TR 2295 6199, ditch with grazed margins. (13) with flowers at TR 2265 6181 by Marsh Hide. (14) TR 2287 6189, TR 2265 6192.
Stodmarsh	TR2262	NNR, SSSI	(1) 30 August 2022 (2) 9 August 2022 (3) 9 July 2022 (4) 7 July 2022 (5) 5 July 2022 (6) 4 July 2022 (7) 4 July 2022 (8) 4 July 2022 (9) 19 September 2021 (10) 19 August 2021 (11) 8 August 2021 (12) 30 June 2021 (13) 1996	(1) AL & BH (2) AL & KO (3) PW (4) VB-H, KF-S & DG-S (5) AL, HSt & KC (6) AL, PW & KC (7) AL & KC (8) AL & PW (9) to (12) AL (13) PW	(1) TR 2263 6232, ditch survey. (2) TR 2256 6198, ditch survey. (3) TR 2255 6215, ditch survey. (4) TR 2366 6282, ditch survey. (5) TR 2278 6220, TR 2286 6199, ditch survey. (6) TR 2259 6223, ditch survey. (7) TR 2274 6201, TR 2272 6216, ditch survey. (8) TR 2273 6010, ditch survey, meadow ditch. (9) TR 2284 6220, TR 2283 6214, TR 2278 6220. (10) TR 2274 6201, TR 2284 6206, TR 2274 6209 ditch with grazed margins (11) TR 2293 6206, fairly recently cleared ditch with cattle grazed margins. (12) TR 2299 6210, ditch cleared last year, leaving a wide marshy portion. (13) TR 2266 6207, TR 2285 6207,

					TR 2287 6189, TR 2291 6213, TR 2292 6206.
Preston Marshes	TR2359, TR2360		(1) 5 July 2016 (2) 1997 (3) 20 September 1997 (4) 22 October 1991	(1) KBRG meeting (2) PW (3) NS (4) CD	(1) In a ditch at TR 230 599, and at TR2360. (2) TR 2346 5991. (3) TR2360. (4) TR 2378 6090, River Corridor Survey, Little Stour.
Stodmarsh	TR2361	SSSI	1996	PW	TR 2352 6184.
Stodmarsh	TR2362	NNR	(1) 8 June 2023 (2) 7 July 2022 (3) 24 Jun 2022 (4) 22 August 2021 (5) 20 June 2021 (6) 21 September 2013 (7) 1996	(1) AL (2) VB-H, KF-S & DG-S (3) AL & RH (4) AL (6) AL & JM (7) AL & JM (8) PW	(1) TR 2301 6207 (2) TR 2343 6287, TR 2356 6279, TR 2358 6291, TR 2382 6282, Stodmarsh ditch survey. (3) TR 2298 6211, Stodmarsh ditch survey. (4) TR 2343 6287, with turions. (5) TR 2324 6238. (6) Ditch, TR 2321 6229. Also (not necessarily this date) the lake in front of Feast's Hide, TR 232 626. (7) TR 2312 6234.
Preston Marshes	TR2461		1998	JP	TR 240 610.
Elmstone valley, near Preston	TR2660		18 July 2000	JP & JW	TR 266 609.
Worth	TR3356		(1) 30 April 2012 (2) 1982	(1) LR (2) ACH	(1) TR 33579 56907, in dyke near bridge. Four-leaved whorls but fragment produced turion when grown on. (2) Hacklinge Ditch Survey: ditches at: TR 33697 56863, TR 33824 56799.
Worth Minnis	TR3454	SSSI	(1) 24 July 1991 (2) 2 March 1983 (3) 1982	(1) FR (2) & (3) ACH	(1) TR3454. (2) Sandwich & Pegwell Bay ditch survey: TR 347 546. (3) Hacklinge Ditch Survey: ditch at TR 34590 54150.
Lydden Valley	TR3455	SSSI	(1) 22 June 2021 (2) 24 August 2018 (3) 2003 (4) 2March 1983 (5) 1982	(1) SB & SL (2) SB (3) CEC (4) & (5) ACH	(1) In a ditch by public footpath at TR 3421 5568. (2) With turions, by a sluice at TR 3421 5568 (3) Hacklinge Ditch Survey: ditches at TR 34400 55818, TR 34466 55514, TR 34472 55879, TR 35729 55296, TR 34071 55864, TR 34094 55797, TR 34620 55652, TR 34236 55675. (4) Sandwich & Pegwell Bay survey. (5) Hacklinge Ditch Survey: ditches at TR 34130 55500, TR 34175 55790, TR 34648 55238, TR 34538 55598, TR 34577 55882, TR 34620 55652, TR 34234 55417, TR 34790 55180.
Lydden Valley	TR3456	SSSI, in part	(1) 1983 (2) 1982	(1) & (2) ACH	(1) Sandwich & Pegwell Bay survey: TR 343 560. (2) Hacklinge Ditch Survey: ditch at TR 34329 56782.
Lydden Valley	TR3553	SSSI	(1) 2003 (2) 1982	(1) CEC (2) ACH	(1) Hacklinge Ditch Survey: ditches at TR 35730 53230, TR 35636 53349, TR 35901 53096. (2) Hacklinge Ditch Survey: ditch at TR 35730 53230.
Lydden Valley	TR3554		1982	ACH	Hacklinge Ditch Survey: ditch at TR 35626 54867.
Lydden Valley	TR3555	SSSI, in part	(1) 2003 (2) 1982	(1) CEC (2) ACH	(1) Hacklinge Ditch Survey: ditches at TR 35951 55231, TR 35760 55640. (2) Hacklinge Ditch Survey: ditches at TR 35930 55500, TR 35951 55231, TR 35000 55170, TR 35610 55550, TR 35723

					55158, TR 35724 55372, TR 35000 55710, TR 35760 55600, TR 35760 55640, TR 35820 55214.
Lydden Valley	TR3556		1982	ACH	Hacklinge Ditch Survey: ditches at TR 35272 56788, TR 35310 56080, TR 35540 56040.
Lydden Valley	TQ3653		1982	ACH	Hacklinge Ditch Survey: ditch at TR 36017 53190.
North east of Betteshanger C.P.	TR3654	SSSI, in part	(1) 12 August 2015 (2) 2003 (3) 1982	(1)SB (2) CEC (3) ACH	(1) With turions in Penfield Sewer at TR 3638 5410. (2) Hacklinge Ditch Survey: ditch at TR 36021 54680. (3) Hacklinge Ditch Survey: ditches at TR 36496 54916, TR 36906 54813, TR 36644 54444, TR 36260 54830, TR 3674 454315, TR 36021 54680, TR 36582 54741.
Lydden Valley	TR3655	SSSI	(1) 2003 (2) 2 March 1983 (3) 1982	(1) CEC (2) & (3) ACH	(1) Hacklinge Ditch Survey: ditches at TR 36030 55120, TR 36532 55398. (2) Sandwich & Pegwell Bay survey: TR 362 555. (3) Hacklinge Ditch Survey: ditches at TR 36427 55633, TR 36602 55465, TR 36659 55239, TR 36277 55107, TR 36731 55427, TR 36754 55197, TR 360405 5550, TR 36520 55600.

Nardus stricta L. (Mat-grass)

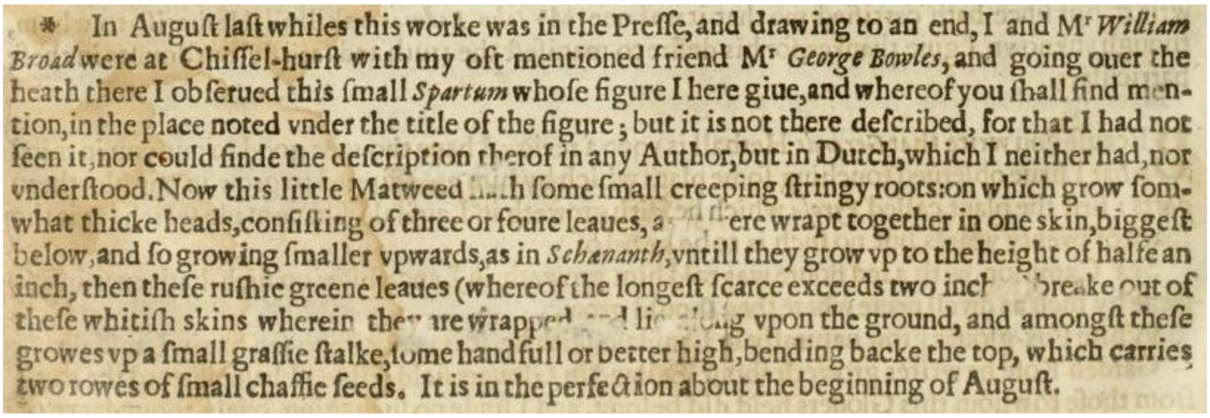
vc 15 and 16

Rarity / scarcity status

Mat-grass is found throughout the British Isles on acid ground, particularly in areas of higher rainfall, and so less frequent in central and eastern England and in central Ireland, and it may dominate large tracts of upland slopes and moorland. Its conservation status is one of 'Least Concern' in Great Britain; but in England it is treated as **Near Threatened**, because its area of occupancy in England is taken to have declined by 23% in comparing records for the periods 1930-69 and 1987-99. In lowland southern England it may be found in heathland, but this has been a declining habitat, and Kent has very little, in any event. It is currently restricted to four sites in the county, and is accordingly very **scarce**. It is a Kent axiophyte and so is regarded as an indicator of good habitat.

Account

The first published record of Mat-grass in Kent was at Chislehurst Common in Thomas Johnson's 1633 edition of Gerard's Herball, added at the end of the book whilst printing was in progress. It shows how Johnson strove to make the work more complete than Gerard had achieved, and his care over accuracy of description (hence the work is often known as Gerard *emaculatus*, i.e. Gerard with blemishes removed).



* In Auguſt laſt whiles this worke was in the Preſſe, and drawing to an end, I and Mr *William Broad* were at Chiſſel-hurſt with my oft mentioned friend Mr *George Bowles*, and going ouer the heath there I obſerued this ſmall *Spartum* whoſe figure I here giue, and whereof you ſhall find mention, in the place noted vnder the title of the figure; but it is not there deſcribed, for that I had not ſeen it, nor could finde the deſcription therof in any Author, but in Dutch, which I neither had, nor vnderſtood. Now this little Matweed hath ſome ſmall creeping ſtringy roots: on which grow ſomwhat thicke heads, conſiſting of three or foure leaues, and were wrapt together in one skin, biggeſt below, and ſo growing ſmaller vpwards, as in *Schænanth*, vntill they grow vp to the height of halfe an inch, then theſe ruſhie greene leaues (whereof the longeſt ſcarce exceeds two inches) breake out of theſe whitiſh skins wherein they are wrapped and lie along vpon the ground, and amongſt theſe growes vp a ſmall graſſie ſtalke, ſome handfull or better high, bending backe the top, which carries two rowes of ſmall chaffie ſeeds. It is in the perfection about the beginning of Auguſt.

This is also the first British record, a previous one from Hampstead Heath having been discounted.[448]

Hothfield]. Photo by Lliam Rooney, 24 July 2013

Hanbury & Marshall (1899) considered it to be local on heaths and moors, very rare in the chalk districts. There were records for the acid ground of the north west Kent commons: Blackheath. Keston, Paul's Cray, St Mary Cray and Dartford Heath. They mentioned Thomas Forster (*Flora Tonbrigensis*, 1816), who considered the grass to be very common on sandy damp commons in the neighbourhood of Tunbridge Wells. There is also mention of wet pastures at Minster, Monkton and St Nicholas as well as Sarre Marshes (1847); it is not now obvious that there would have been appropriate habitat. G.E. Smith (*A Catalogue of Rare and Remarkable Phaenogamous Plants collected in south Kent*, 1829) knew it 'Upon the dry parts of Willesboro' Leas, Hothfield Heath', and this last location has been reported on a number of occasions since.

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[448] Edgington, J.A. (2010). The first British Record of *Nardus stricta* L. (Poaceae). *Watsonia* **28**: 123-127.

Francis Rose was able to point to considerable continuity, with records at Chislehurst Common (grass-heath, 1945); Keston Common (1945); Hothfield (grass-heath, 1943); and Willesborough Lees (damp *Molinia- Agrostis* grassland on Folkestone Sands, 1950). The last two sites were part of a line of comparable geology across East Kent, which also gave rising to his sightings at Monks Horton Priory (TR 110 389, an acid boggy field on Folkestone Sands, 1953) and Gibbin's Brook (damp grass-heath on Folkestone Sands). However, although the species was specifically searched for, the 1971-80 survey (Philp, 1982) only produced two tetrad records: Hothfield and Hatch Park, the latter being another site along the Folkestone Formation sands. The 1991-2005 survey (Philp, 2010) could not locate the grass at Hothfield, but found it still at Hatch Park and also in Knole Park, Sevenoaks, where it has since been found growing in two sites, one at the head of a dry valley cutting through the Hythe Formation, with grassland on acid, fertile ground, long grazed by deer (as with Hatch Park) for whom the grass apparently has low palatability. It was also still present at Tunbridge Wells Common, another acid site with long continuity of grassland.

Hatch Park. Photo by Lliam Rooney, 21 July 2016

Our 2010-24 records support the continued presence of the grass at Hothfield (in spite of it not having been seen 1991-2005), Knole Park and Hatch Park. At the last site, it is frequent in an area of sandy ground c.50 x 50 metres, with very little other vegetation cover, other than mosses and lichens, but with some *Festuca filiformis* (Fine-leaved Sheep's-fescue), *Galium saxatile* (Heath Bedstraw) and *Rumex acetosella* (Sheep's Sorrel). Searches have not yet succeeded in tracing it at Tunbridge Wells Common. A new site has been added, however, with the discovery of a patch about a foot across at Bedgebury pinetum on the Tunbridge Wells Sand Formation. The small size of the patch may point to possible introduction with forestry operations, but the location is such as would be consistent with native occurrence.

Hothfield. Photo by Lliam Rooney, 24 July 2013

Nardus stricta is a slow growing species, which would be likely to be out-competed, but for the infertility of the ground in which it grows. It avoids shaded and flooded terrain and is tolerant of trampling. It spreads through rhizomatous growth at the rate of c. 20mm p.a., with the lower leaves spreading in a semi-circle, away from the old part of the rhizome, which persists for several years.[449] The effects of this were evident at Hatch Park, where it was noted (2016) that many old tussocks had expanded with circular growth, with the centre lost to decay. Spread by seed is supposed to be rare, the appearance of small isolated plants being normally a product of vegetative spread from branching rhizomes, where the branches have become separated through decay of the older parts, or tufts detached by grazing have re-established elsewhere. It is a wiry, densely tufted grass, with a one-sided inflorescence of purplish-black flowers; the whitish old growth being distinctive when the flowers have gone over.

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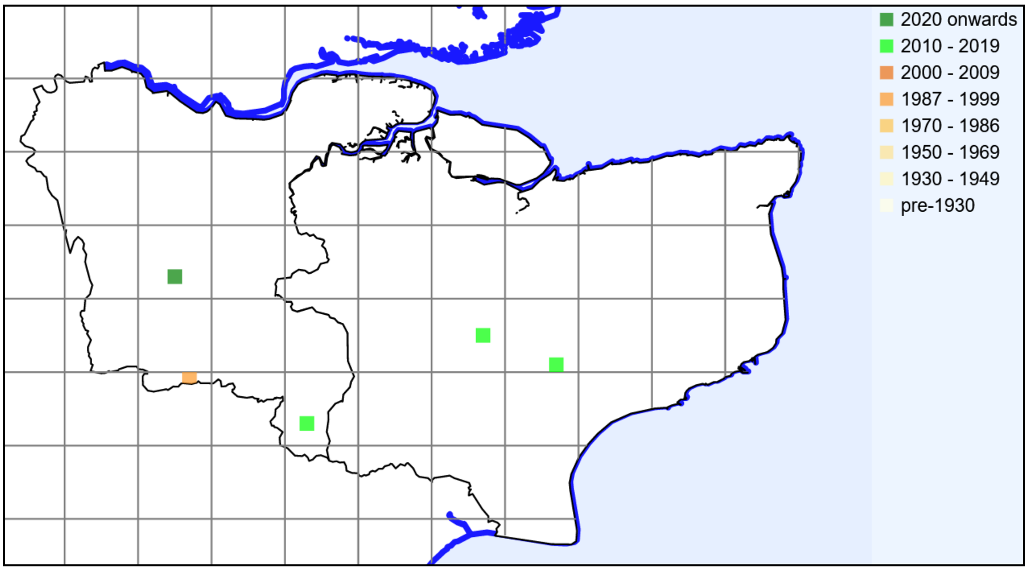
[449] Chadwick, M.J. (1960). *Nardus stricta* L. Biological Flora of the British Isles. *Journal of Ecology* **48**: 255-267

***Nardus stricta* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Site	Grid reference	Site status	Last record date	Recorder	Comments
Tunbridge Wells Common	TQ53U	Common land managed by commons conservators	(1) 11 June 2000 (2) Between 1991-1998 inclusive	(1) JP at KFC meeting (2) EGP (Philp, 2010)	(1) TQ5738; not mentioned in meeting report. (2) TQ53U. Recorded regularly in MP's notebooks 1992-2002 (per Ian Beavis) in company with *Campanula rotundifolia* and *Galium saxatile*; the inferred location is south of Wellington Rocks. [Not found, 2017, 2018.]
Knole Park	TQ5452	SSSI	(1) 10 July 2019 (2) 5 October 2011 (3) after 1990, before 2006	(1) & (2) GK (3) EGP (Philp, 2010)	(1) Site as in 2011, but grass appeared more extensive. There is a very local main area where near-dominant, but scattered tufts beyond seemed more frequent than before. Bracken still in general vicinity but patchy, and it may be that control measures have been taken, as is the case further down the valley. (2) c. 5402 5241. Scattered tufts on south eastern slope of head of long valley in Knole Park, north west facing, over an area c. 20 x 20m. In deer-grazed *Agrostis capillaris* grassland on sandy / cherty ground. Threats: general bracken encroachment in the park. (3) TQ55L, which may apply to this colony or the next.
Knole Park	TQ5553	SSSI	(1) 31 January 2020 (2) 28 July 2019	(1) & (2) GK & SK	(1) Off east end of Chestnut Walk in Knole Park, from TQ 55148 53546 to planted cedar at TQ 55207 53599, plus one plant eastwards of tree, c. TQ 55220 53614. Growing mostly in centre of the avenue between trees, dominant there in part, at times across full width. (2) c. TQ5514 5355 to TQ 5520 5359, in a strip 10m wide for about 70m along the eastern continuation of Chestnut walk, Knole Park, acid grassland of open

					ride. In part dominant, also scattered clumps. Associated flora: *Agrostis capillaris*, *Anthoxanthum odoratum*, *Juncus effusus*, *J. conglomeratus*, *Potentilla erecta*, *Galium saxatile*. A much stronger colony than that at the western end of Chestnut Walk.
Bedgebury pinetum	TQ7233	Access land	26 July 2016	SB & OL	One patch about a foot across on a path with the Pinetum at TQ 72271 33252.
Hothfield Common	TQ9645	KWT reserve, SSSI	9 July 2013	SB	Scattered mats of plants on bare peat path from TQ 96905 45857 to cross path at TQ 96884 45838 continuing for a further 30m of path to TQ 96912 45816, with *Agrostis capillaris, Danthonia decumbens, Calluna vulgaris, Deschampsia flexuosa* and *Potentilla erecta.*
Hatch Park	TR0640	SSSI	15 December 2011	SB	(a) One plant on path in Deer Park at TR 06594 40309. (b) Frequent in an area of sandy heathland approx 50 x 20m TR 06565 40985, in Deer Park with *Galium saxatile* and *Rumex acetosella.*
Hatch Park	TR0641	SSSI	(1) 21 July 2016 (2) 29 August 2013 (3) 15 December 2011 (4) 19 February 2002 (5) Between 1991-99 inclusive	(1) KBRG meeting (2) GK (3) SB (4) JP (5) EGP (Philp, 2010)	(1) TR 065 410, extensive on sandy ground, with fairly little vegetation beyond moss/lichen cover, at eastern edge of old sand pit, and extending down into it. (2) Extending beyond bounds of the sandy hollows east of footpath in deer park. Generally in very lightly vegetated areas, with *Festuca filiformis*. (3) Frequent in approx 50 x 50m of a sandy hollow at TR 06545 41033 in Deer Park. (4) TR04Q

Narthecium ossifragum (L.) Huds. (Bog Asphodel)

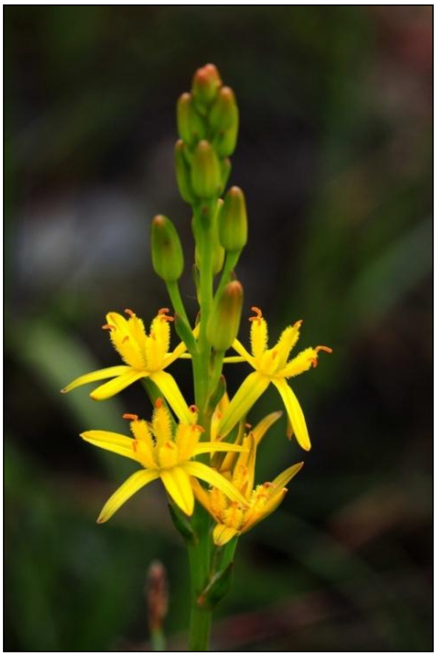
vc 15 and 16

Rarity / scarcity status

Bog Asphodel is found throughout the British Isles on boggy ground and acid flushes, particularly in areas of higher rainfall, and so is less frequent in central and eastern England and in central Ireland. Its conservation status is one of 'Least Concern' in England and in Great Britain as a whole. In Kent, however, there is very little appropriate habitat, and the plant is **rare**. It is a Kent axiophyte and so is regarded as an indicator of good habitat.

Account

The first published county record is that of John Blackstone in his *Specimen Botanicum* (1746), in which he refers to it being found 'In the Bogs near *Caesar's* Camp at *Bromley, Kent*. Mr. *Watson*.' (i.e., Keston). There are many historic records for this area. Whilst that for Ravensbourne Well, Keston given in Hanbury & Marshall (1899) presumably relates to Caesar's Well (TQ 4195 6404), now paved around and unsuitable but likely to have been the same location as Blackstone's, the plant also grew – and still does – in the small valley to the west, which harbours Keston Bog. A further historic record at Hayes Common, which is contiguous with Keston Common, may be different. Keston Bog itself has formed in a valley bearing a seasonal stream fed by lateral seepage, where the Blackheath Pebble member of the Harwich Formation is underlain by impermeable clay. A decline in its suitability for Bog Asphodel, due to tree shading and reduction in water availability through development appears to have been halted by conservation works, so that there is a good population here, in its only London (and West Kent) station.[450]



Hothfield. Photo by Lliam Rooney, 15 June 2010

Hothfield. Photo by Lliam Rooney, 5 July 2013

Otherwise, there have been few Kent records for this species. Thomas Forster (*Flora Tonbrigensis*, 1816) gave it as 'On the bogs, on Ashdown and Waterdown Forests, and on other bogs towards Tonbridge, very common'. It is often difficult to tell whether Forster's records (subtitled *A catalogue of plants growing wild in the neighbourhood of Tonbridge Wells*) relate to the Sussex or Kent part of the neighbourhood, but here it is clear that he was referring to both. Ian Beavis refers to Fisher's Common, north of Mount Ephraim, as swallowed up by the development of Tunbridge Wells, but which 'was once a rich area of open heathland, including rock outcrops, freshwater features and boggy areas with asphodel and sundew'.[451] A further location in the vicinity of Tunbridge Wells, Hawkenbury Bog, was mentioned in Philp (1982), but this (which has not survived as a bog habitat) is in botanical vice county 14, East Sussex.

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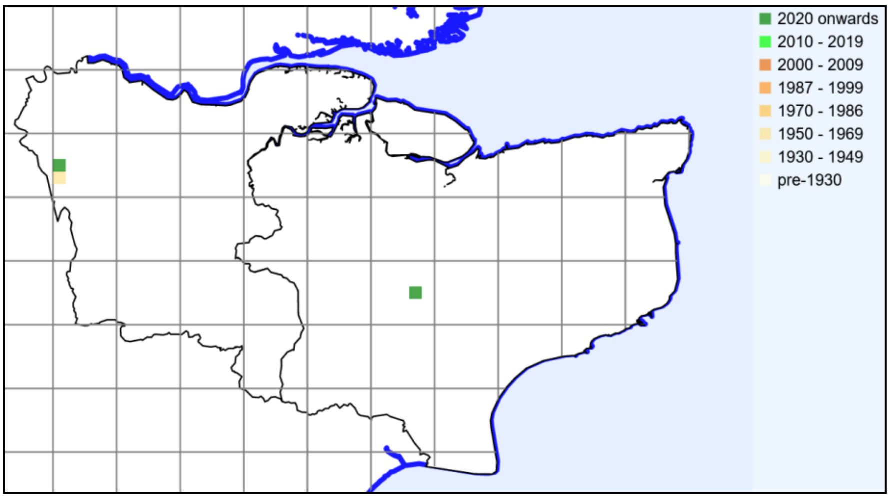
[450] John, J. & Price, J. (2014). Heathland restoration at Keston and Hayes Commons. *Transactions of the Kent Field Club* **19**: 75-99.

[451] Beavis, I.C. (2014). Tunbridge Wells heathlands; past and present. *Transactions of the Kent Field Club* **19**: 100-107.



***Narthecium ossifragum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

In East Kent, G.E. Smith, in his *Catalogue of rare or remarkable Phaenogamous Plants* (1829) mentions the species at Willesborough Lees, then an area of 'treacherous bog', but now a habitat where surviving bog plants of open habitat are dependent on the occasional gaps made in tree cover; Bog Asphodel has not been reported there since. He remarked on the find there of a variety with narrow tapering eaves, tall stems, and pale flowers (these are normally golden yellow), and also noted it 'With *Lycopodium inundatum*, on Hothfield Heath near the first clump of fir trees to the left from Ashford'[452] Hanbury & Marshall (1899) remarked that it was not confined to this one station at Hothfield, and many botanists have since collected and/or recorded the species from Hothfield Common, where bogland arises through seepage from the Folkestone Formation where this meets the impermeable clays of the Sandgate Formation. Within this very limited area, the species is not uncommon.

Narthecium ossifragum apparently grows best in wet acid conditions (but not standing pools) where there is frequent lateral movement of water and/or fluctuations in the water table, ideally where the summer water table is not within 10 cm of the surface[453]. It is sometimes regarded as an indicator of flushed conditions. At Hothfield main bog, which is not level, but which is in effect a sloping stream valley fed by lateral seepage, the water table has been noted as varying by 9cm at the stream location and not falling significantly below the surface, even in a dry summer; and elsewhere in the bog ranging from 4cm to 18cm below the surface, dropping to 25-40cm below in a dry summer (1973), 12-20cm in a wet summer (1974).[454] The bog therefore has at least in parts other than the main stream afforded conditions suitable for growth of *Narthecium ossifragum*, when studied in the 1970s.

Hothfield. Photo by David Steere, 17 July 2016

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[452] As given in MS (1830-32) in Smith's own interleaved copy of his book, from which M.H. Cowell took this record for *A Floral Guide for East Kent* (1839).

[453] Summerfield , R.J. (1971). The ecology of *Narthecium ossifragum* (L.) Huds. Ph.D. thesis, University of Nottingham. Cited in Summerfield, R.J. (1974). *Narthecium ossifragum* (L.) Huds). Biological Flora of the British Isles. *Journal of Ecology* **62**: 325-339.

[454] Burnham, C.P. & Gooderham, P.T. (1975). The water regime of the upper part of the main bog at Hothfield, *Transactions of the Kent Field Club* **5(3)**: 139-141.

Plant communities where the species grows at Hothfield have been assessed by Alex Lockton as including M21 (*Narthecium ossifragum – Sphagnum papillosum* valley mire), in the middle of bog 2, where the water is most acid and there are hummocks of *Sphagnum*. This amounts to a typical southern English valley mire, albeit a rare habitat in Kent. *Narthecium* is also present in M29 community (*Hypericum elodes – Potamogeton polygonifolius* soakway) and M6 (*Carex echinata – Sphagnum recurvum / auriculatum* mire, although the *Sphagnum* species actually recorded here were *S. denticulatum*, *S. fallax* and *S. subnitens*).

Hothfield. Photo by Lliam Rooney, 5 July 2013

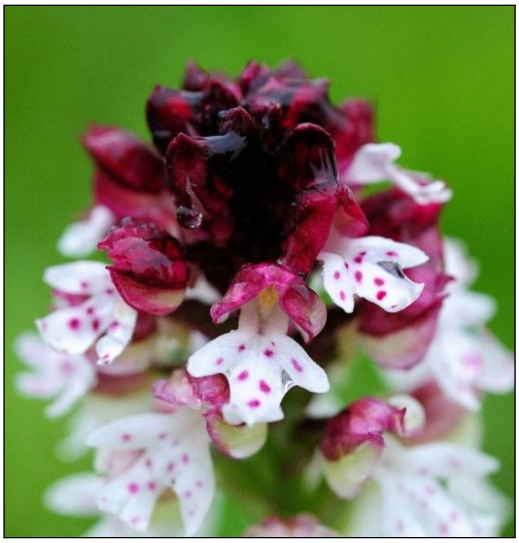
Site	Grid reference	Site status	Last record date	Recorder	Comments
Keston (metropolitan vc16)	TQ4164	SSSI	(1) 24 June 2022 (2) 6 August 2016 (3) 28 May 2011 (4) 24 September 1992	(1) SLo (2) SL (3) OFC meeting (4) FR & PHa	(1) TQ 417 643, Keston Common. (2) Keston Bog, small valley between TQ 4170 6423 and TQ 4171 6434. Abundant patches along flushes down eastern slope. (3) TQ 417 643, Keston Bog. (4) Very abundant now. There are numerous other records by many botanists over a long period.
Hothfield	TQ9645	SSSI, KWT reserve	(1) 23 June 2022 (2) 3 June 2020 (3) 1 July 2019 (4) 17 September 2018 (5) 17 July 2016 (6) 15 June 2010	(1) AL (2) AW (3) AL & JM (4) AW (5) DS (6) JA	(1) TQ 968 456. (2) TQ9645. (3) (a) TQ 9682 4565, by the boardwalk in bog 2, in M21 *Narthecium ossifragum* valley mire. (b) TQ 9697 4568, top of bog 2, M29 *Hypericum elodes* soakway. (c) TQ 9697 4568, middle of bog 2, M6 *Carex echinata* mire. (d) TQ 9694 4568, middle of bog 2, M21 *Narthecium ossifragum* valley mire. (4) TQ9645. (5) Main bog. (6) TQ 96827 45639 in bog 2. 500 + spikes just coming into full bloom. There are numerous other records by many botanists over a long period.

Neotinea ustulata (L.) R.M. Bateman, Pridgeon & M.W. Chase (= *Orchis ustulata* L., Burnt Orchid)

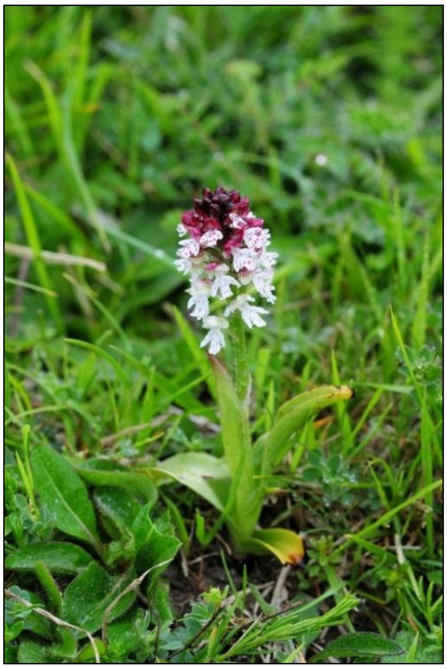
vc 15; long gone from vc 16

Rarity / scarcity status

Burnt Orchid, once fairly widespread in Britain, has undergone a major decline since the 1930s, largely due to loss of habitat and changes in agricultural practices, and has retreated to Wiltshire, Hampshire and a few other localities, becoming **nationally scarce**. It is regarded as an **Endangered** species in both Great Britain as a whole and England, its area of occupancy in England having declined by over 50% in comparing records for the periods 1930-69 and 1987-99. In Kent it is **rare**. It is a Kent axiophyte and so is regarded as an indicator of good habitat; it is also a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006.



Lydden. Photos by Lliam Rooney, 11 June 2013



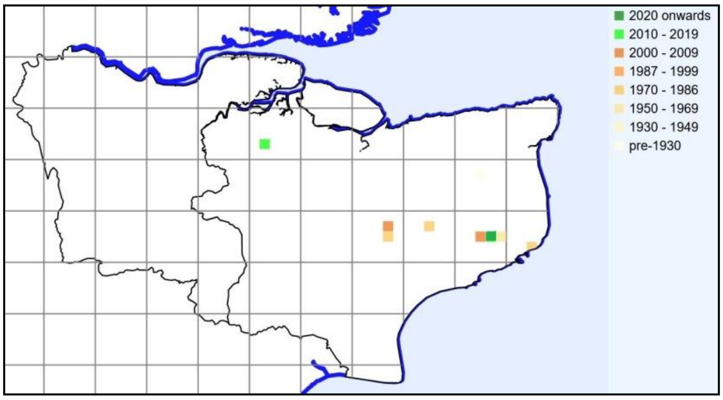
Account

The first Kentish record for the Burnt Orchid was published in 1732, in a translation by John Martyn of Tournefort's *History of Plants Growing about Paris*, in which Martyn added material by way of accommodating to Great Britain the French observations as regards Parisian status: it was then said to be present about Gravesend. Hanbury & Marshall (1899) considered the species to be local on chalk downs, but fairly frequent in some of the botanical districts. They summarised the earlier records, which included (by way of sample) presence 'Here and there on the chalk districts between Knockholt and Wrotham' (Edward Jenner, *A Flora of Tunbridge Wells*, 1845); 'Common between Dover and St. Margaret's' (W.H. Beeby); 'on the hills about Dover, sparingly' (Lewis Dillwyn, C*atalogue of the more rare Plants found in the Environs of Dover*, 1802); 'Queen Down Warren, Hartlip!, plentiful' (seen by Hanbury and/or Marshall); Blue-Bell Hill, 'Hills surrounding the lower Bell and overlooking Kits Cotty House' (record by W. Pamplin in M.H. Cowell's *A Floral Guide for East Kent,* 1839).

When Francis Rose came to write his (unpublished) *Flora*, *c*.1950-60, he found that the species was now rare, and that it had declined since Hanbury and Marshall's time due to ploughing up and lack of grazing, of chalk grassland. It was still in local abundance in some places on the chalk between the R. Stour and the coast, but since 1947 there had been records from only seven localities (in TQ86, TR04, 14, 23, 24 and 34), and it was long extinct in West Kent, vc 16. Some of his specimens in **MNE** carry habitat descriptions, e.g. at Langdon Bay in *Festuca ovina* turf on a cliff top about ¼ mile from the sea (1954); Woodville-Lydden Downs chalk grassland with *Festuca ovina*, *F. rubra*, *Brachypodium pinnatum* agg., *Bromopsis erecta*; 1 mile south west of Lydden, chalk pasture on north west slope: *Festuca – Briza – Koeleria – Avenula – Carex flacca* (1959). As well as the limitations imposed by the need of the species for short turf (without itself being grazed off), it is apparent from Francis Rose's data that, even in good localities, the occurrence of flowering plants was very variable, with occurrences at Queendown Warren in the period 1939-61 varying from nil or one, to 24 inflorescences.

Philp (1982) considered Burnt Orchid to be very rare and then known only from Queendown Warren, Wye Downs and in two areas of downland near Lydden, with only a few plants in each of these localities. From the 1990-2005 county survey (Philp, 2010), it had apparently gone from Queendown Warren (last seen, 1989[455]) and was only known, in small numbers from Wye Crown and the two Lydden areas. At Wye Crown, sightings in 2000 and 2006 have had no successors; and there was a gap in Lydden records after 2006. Many former Kentish sites were visited in 2011 as part of the BSBI's Threatened Plant Project, but no plants were seen, although some sites still appeared suitable. However, in 2013, Burnt Orchid re-appeared at Lydden NNR: two flowering plants, about 45m apart. They were growing on a chalk grassland slope (*Brachypodium pinnatum* agg. present, but not over-dominant), south to south west facing, with an associated flora including *Poterium sanguisorba* (Salad Burnet), *Briza media* (Quaking-grass), *Cirsium acaule* (Dwarf Thistle), *Lotus corniculatus* (Common Bird's-foot-trefoil), *Galium verum* (Lady's Bedstraw) and *Succisa pratensis* (Devil's-bit Scabious). After a gap, Burnt Orchid re-appeared there, a single plant, in May 2018; this was hand-pollinated, in order to increase the chances of persistence at this location, although the spike with swollen seed capsules disappeared next month. Two flowers appeared in 2019; a flower spike was also formed in 2022; and in 2023 two plants formed flower spikes, and may well have been the same plants that flowered in 2019.

The outlook for *Neotinea ustulata* in Kent is not good, having regard to the pattern of long decline and erratic recent sightings. The traditional explanations for past decline (ploughing up, cessation of grazing, development) do not seem to provide a complete answer to its difficulties, which are not just a British issue: disappearance (the Netherlands) and decline (the Czech Republic) have been noted elsewhere in Europe. It is a particularly short-lived orchid, albeit with a long phase of seedling development, heavily mycorrhiza-dependent[456], and so population recruitment appears far from straightforward. Absence or scarcity of its pollinator[457] is also relevant.



***Neotinea ustulata* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Then there is also the need for short turf, the flowering spike itself being with us seldom more than 15cm high and often less than 10cm, so that flowering might readily be affected adversely by the grazing regime or lack of it. Alfred Gay noted in 2010 that a former site at Warren Bottom, Lydden then seemed unsuitable, although the sward was very short, because the intensity of rabbit grazing was such that any vegetative growth would have been nibbled off. The converse situation is more likely, however, as with another site near Lydden, surveyed by Geoffrey Kitchener and Lliam Rooney in 2011, where stock grazing was not undertaken, rabbits were few, with some scrubbing up having taken place and with coarse tussocks of *Brachypodium rupestre* dominating elsewhere.

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[455] There are purported records of 2001 and 2011, but no recorder or detail assigned to them, other than a generic grid-reference for the reserve, so not capable of being validated.

[456] General information taken from Tali, K., Fooet, M.J.Y. & Kull, T. (2004). *Orchis ustulata* L. Biological Flora of the British Isles. *Journal of Ecology* **92**: 174-184.

[457] Its UK pollinator species is/are unknown. *Tachina magnicornis* has been mentioned for *N. ustulata* var. *aestivalis* in Germany, but this wasp has little UK presence, is unrecorded in Kent, and, on flowering times, Kent's *N. ustulata* is var. *ustulata*, so that pollination readiness and pollinator flight times would not necessarily match up for this species. *Leptura livida*, a longhorn beetle, however, has been mentioned as a Continental pollinator for var. *ustulata*, and is known in Kent.

The Kent form of *N. ustulata* is var. *ustulata* (flowering mid-May to mid-June); a later flowering variety (generally July), var. *aestivalis*, is also known from the South Downs of East Sussex. The species, whilst appearing in some respects like a miniature *Orchis purpurea* (Lady Orchid) is not readily confusable with any other British orchid.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Queendown Warren	TQ8262	KWT reserve, SSSI, Access land	(1) 1 June 1989 (2) 20 May 1989 (3) 22 May 1971	(1) OD, PD & FR (2) MF (3) FR	(1) One inflorescence seen, only top florets seen. Probably same record as by OD, on east bank, TQ 828 628, last record for this site. (2) TQ 828 629. (3) By pylon; and opposite elms.
Wye Crown	TR04T		1991-2000	EGP (Philp, 2010)	
Wye Downs	TR0744	SSSI	1979, 1980, 1981	JD	TR 077 449, compartment 21 of SSSI.
Lydden [Spout]	TR2645		1 June 1986	HW	16 plants {English Nature record; the grid reference is plausible, the description as Lydden Spout is not.].
Lydden	TR2744		20 May 1989	MF	TR 275 447
Lydden	TR2745	NNR, SSSI, Access land	(1) 15 May 2023 (2) 12 May 2022 (3) 18 March 2020 (4) 15 May 2019 (5)18 May 2018 (6) 14 June 2013 (7) 10 & 11 June 2013 (8) 1991-99 (9) 1996 (10) 9 June 1995 (11) 21 May 1989 (12) 23 June 1986 (13) 26 May 1972 (14) 22 May 1971	(1) AG (2) AG (3) AG (4) AG (5) AG (6)AG (7) A&MT, KBRG meeting (8) EGP (Philp, 2010) (9) Anon (10) FR (11) MF (12), (13) & (14) FR	(1) Two plants, probably the same as flowered in 2019, ine flowering, the other approaching this. (2) One rosette with flower spike beginning to emerge, usual site. (3) 2 rosettes at earlier site. (4) Plant in flower, same grid ref and presumably the same plant as in 2018, plus another smaller one 2m away. Hand-pollinated. (5) TR 27787 45401, found independently later by other botanists. Hand-pollinated and swollen seed capsules present on 13 June, but only base of spike left on 25 June. (6) A further 2013 flowering plant at TR 2762 4548 (about 45 metres NWW of plant recorded earlier in the month). (7) Single flowering plant at TR 27659 45469, found on 10 June by A&MT, seen by KBRG meeting on 11 June, on S- facing *Brachypodium pinnatum* agg. grassland slope with associated flora *Poterium sanguisorba*, *Briza media*, *Cirsium acaule*, *Lotus corniculatus*, *Galium verum* and *Succisa pratensis*. (8) Recorded as TR24S – may be this monad. (9) Seen by warden and reported to FR, JP & IB, who did not find it on 6 June. (10) Seven plants in group. This record also given for 5 June, by pit. (11) TR 274 457. (12) 5 inflorescences on spur to west. (13) 17 plants, very fine. (14) On spur.
Lydden	TR24M	MOD land	(1) 30 May 2005 (2) 30 June 1986	(1) PG & EGP (2) FR	(1) TR24M. (2) Five inflorescences, Warren

			(3) 1985	(3) FR	Lane. (3) Nine plants, Warren Lane. [Not found at TR 255 448 in 2010 by AG, site overgrazed by rabbits.]
Langdon Bay	TR3442		1981	FH	

Neottia nidus-avis (L.) Rich. (Bird's-nest Orchid)

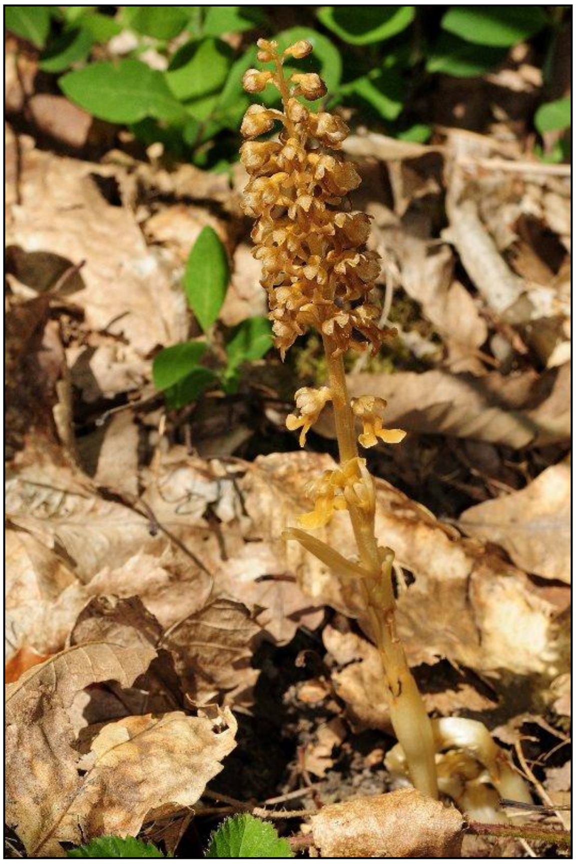
vc 15 and 16

Rarity / scarcity status

Bird's-nest Orchid is found in shady woodland scattered through most of the British Isles, especially in southern England. It is in Great Britain as a whole regarded as **Near Threatened**, but in England it is treated as **Vulnerable** to the risk of extinction, because its area of occupancy in England is taken to have declined by 32% in comparing records for the periods 1930-69 and 1987-99. In Kent, its tetrad distribution appears to have shrunk by 73% between the county surveys of 1971-80 and 1991-2005, although this extent of decline is not supported by subsequent recording. It is, however, neither rare nor scarce in the county. Its inclusion in the register reflects the national position and the view expressed in Philp (2010) that it appears to have declined in Kent quite seriously in recent times. It is a Kent axiophyte and so is regarded as an indicator of good habitat.

Account

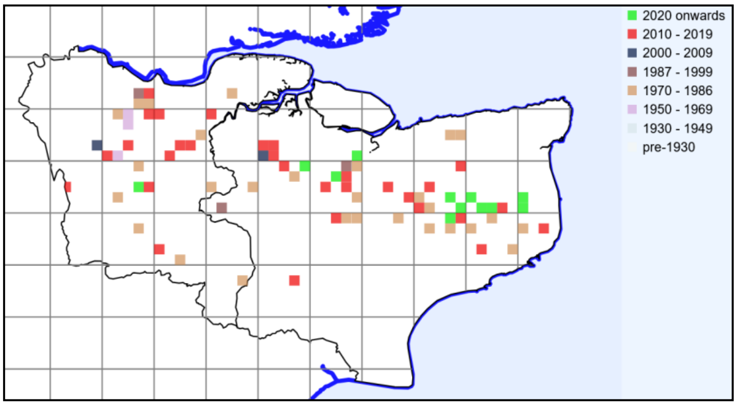
The first British record for the species is Kentish, by John Gerard in his *Herball* (1597): 'I found it growing in the middle of a wood in Kent two miles from Graves end, neer unto a worshipfull gentlemans house called master *William Swan,* of Howcke green [Hook Place, Hook Green, Southfleet]. The wood belongeth to one master *John Sidley*: which plant I did never see else where. And because it is very rare I am the more willing to give you all the markes in the wood for your better finding it, that is to say, the ground is covered all over in the same place neere about it with the herbe Sanycle [*Sanicula europaea*, Sanicle], and also the kinde of Orchis called *Hermaphroditica*, or Butter-flie Satyrion [*Platanthera chlorantha*, Greater Butterfly-orchid]'. It is unusual to get so fulsome a habitat description so early in botanical literature, it was an area well known to Gerard, and we can infer that this was probably deciduous woodland on chalk, possibly with some overlay of clay-with flints, and close to the interface of the Thanet Formation; and that the understorey was sufficiently open for Sanicle to grow, and the wood sufficiently shady for the Greater Butterfly-orchid.



Perry Wood. Photos by Lliam Rooney, 23 May 2010

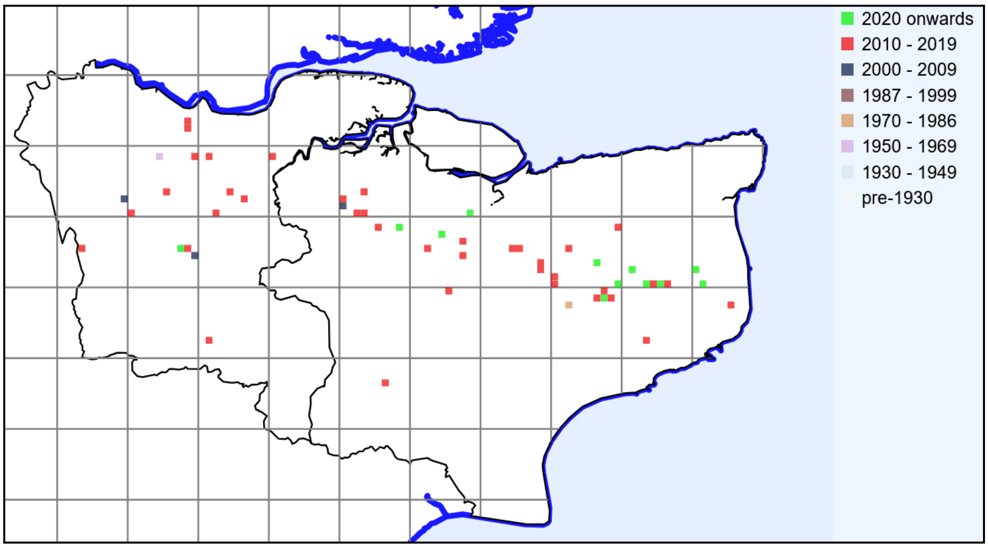
Hanbury & Marshall (1899) assessed its status as 'frequent, particularly on the chalk' in 'Shady woods and copses, chiefly under Yew, Beech and Hazel'. The historic and reported records which they give are well spread across the county, mostly on the chalk, but with outliers, e.g. Chislehurst, Cranbrook and Goudhurst. There are also specimens in **MNE** away from the chalk, such as at Abbey Wood (1861, woodland on Blackheath Beds); Hermitage Woods, Barming (1894, woodland on chert drift); Linton (1895, woodland on Hythe Beds). Some of this range of substrates was recognised by Francis Rose's collecting, but most of his records in the 1940s and 1950s fell into a familiar pattern: ¼ mile east of Downe in beechwood on chalk (1946); west of Shoreham, beechwood on edge of downs on chalk (1945); Longreach wood, Stockbury, mixed woodland on chalk – beech, yew, ash, etc. (1954); Wichling Wood, Sittingbourne, beechwood on chalk (1949); Syndale Wood, Ospringe, ash-hazel coppice on chalk (1956); east of Knowlton under beeches on chalk (1955).

Philp (1982) found Bird's-nest Orchid to be rather local, in 44 tetrads, in shady woods and copses, particularly under beech trees. However, the 1991-2005 survey published as Philp (2010) located the species in only 12 tetrads and it was supposed that there had been a serious decline. Our 2010-23 records do not support this position at all, as the orchid has been found in 44 tetrads (52 monads). Whilst it is likely that the species has declined since its historic status as 'frequent', presumably with the grubbing out of woodland, the change from broad-leaved tree planting to conifers (now no longer so prevalent) and the use of heavy machinery in forestry operations, it is unclear how far these causes are represented in recent decline. It is likely that some of the apparent change between 1971-80 (Philp, 1982) and 1991-2005 (Philp, 2010) is a product of recording methods. The former survey was undertaken by a network of Kent Field Club recorders and the latter by Eric Philp alone: orchid records in particular appear likely to be collected more thoroughly by crowd-sourcing.



***Neottia nidus-avis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

While the total of recorded tetrads is one more for 2010-24 as for 1971-80 (but slightly less, if one excludes three Greater London tetrads, as this was not an area covered by the earlier survey), the tetrad distribution map shows that these were not necessarily the same sites. There is, however, a clear tendency towards occurrence on the chalk Downs. The current position is shown at higher resolution in the monad map below; it lacks older records as monad recording only became the norm in Kent from 2010.

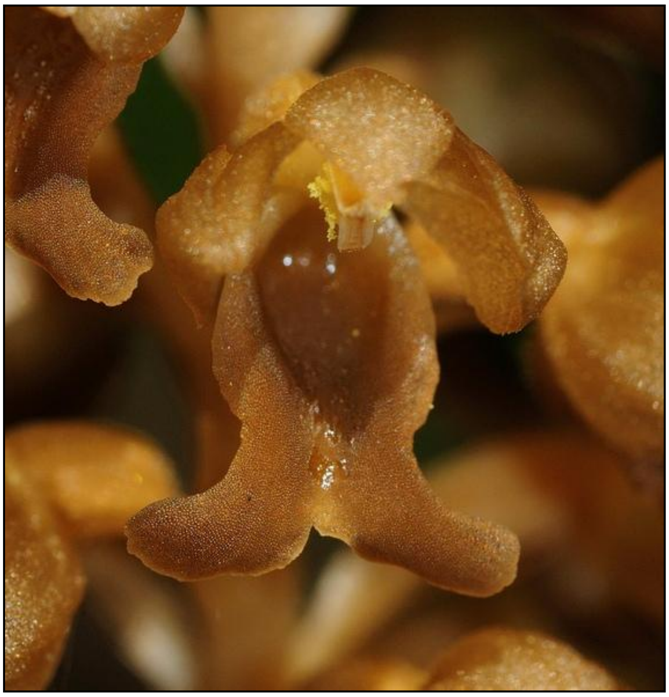


***Neottia nidus-avis* Kent records to 2024 mapped at monad level, from BSBI database.**

However, there has been a decline in population sizes since towards the end of the 20th century (David Johnson, personal communication), with some west Kent colonies reducing from c. 20 plants to a handful, so that continued presence in a tetrad or monad is not fully indicative of healthy status. Nevertheless, some substantial populations remain: 40 spikes were counted by David Johnson and Alfred Gay in 2013 at Covet Wood (TR1848), growing amongst numerous plants of its relative, *Neottia ovata* (Common Twayblade); and in the same year Sue Buckingham recorded c. 250 spikes at Woolage (TR2350) under beech with abundant *Cephalanthera damasonium* (White Helleborine), which favours the same habitat; over 120 plants were seen in 2018 near Tilmanstone (TR3052) by Steve Coates and Mel Lloyd.

Neottia nidus-avis lacks chlorophyll and for the acquisition of nutrients it is dependent upon mycorrhizal fungi which themselves have an association with the roots of trees for the transport of water, carbon and other nutrients. It also appears that the presence of a specific mycorrhizal fungus (aff. *Sebacina dimitica*) is also requisite for germination and seedling growth of the orchid. Accordingly, *Neottia nidus-avis* grows in shaded habitats where chlorophyllous plants may be unable to survive, but the apparent suitability of the habitat may not assist if the fungus is not present; this may also point to the strong association with beech, and to clumping of populations where germination follows the patchy presence of the associative fungus. Our 2010-22 records are mostly associated with the leaf litter and deep shade of beech, although there are also sightings in the presence of chestnut coppice with hazel (Pembury Walks – also with atypical geology); hornbeam and yew (Trottiscliffe); yew (Stockbury Hill Wood); alder and hazel (Charing); hornbeam and hazel (Denge Woods); ash-hazel-maple woodland (Denge Woods again); birch and hornbeam (Knowle Wood, Kingston).

The flowers are pollinated by a variety of insects, and Darwin noted pollinia which had been removed during the process. He remarked on an unusually fine spike, sent to him by Mr. Oxenden from South Kent, which had 41 flowers and bore 27 large capsules as well as smaller ones.[458]



Perry Wood. Photo by Lliam Rooney, 23 May 2010

When seen, and this may not be easy in poor lighting camouflaged against dead leaves, the orchid is not readily mistaken for any other species except, perhaps, for *Orobanche* spp. (Broomrapes), which can be a similar yellowish-brown as they also lack chlorophyll. Hanbury & Marshall (1899) rejected a coastal cliff record near Dover on the basis of just such confusion. *Orobanche* may be expected to grow in well-lit conditions where there are chlorophyllous plants to parasitise. *Orobanche hederae* (Ivy Broomrape) is most likely to venture into marginal woodland shade; but normally the habitat of *Neottia nidus-avis* would be very distinct, and *Orobanche* flowers have a three-lobed lower lip; the orchid's lip is two-lobed.

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[458] Darwin, C. (1862). *On the various contrivances by which British and foreign orchids are fertilised by insect, and on the good effects of intercrossing*. John Murray, London.

Nepeta cataria L. (Cat-mint)

vc 15 and 16

Rarity / scarcity status

Cat-mint is currently considered to be an archaeophyte, or ancient introduction, derived from its herbal use and now scattered in grassland, waysides and rough calcareous ground in England and Wales. It is in Great Britain as a whole and in England regarded as **Vulnerable** to the risk of extinction, because its area of occupancy in England is taken to have declined by 34% in comparing records for the periods 1930-69 and 1987-99. In Kent there is evidence of decline after 1971-80, and it is verging on **scarce.**

Conyer. Photos by Lliam Rooney, 13 August 2013

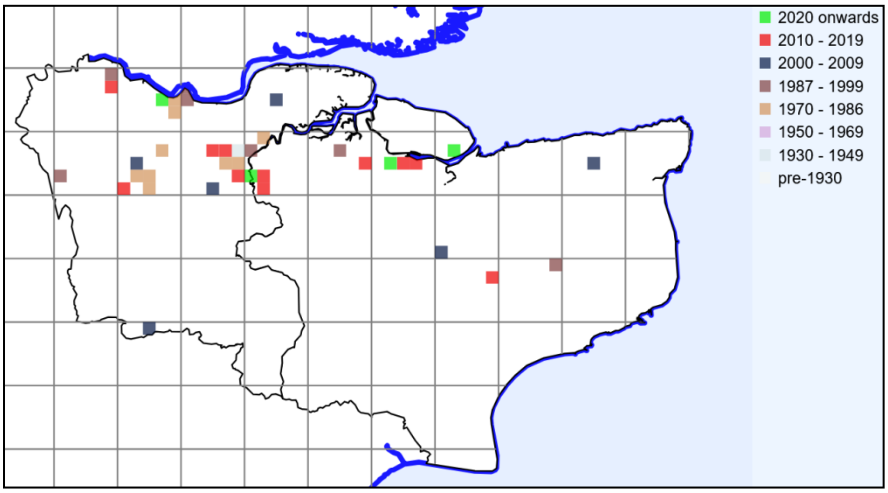
Account

The species was first noted in Kent by Thomas Johnson (*Iter Plantarum*, 1629) in the course of his journey between Gravesend and Rochester, and it also featured in his *Descriptio Itineris* (1632), when found in the company of a local medical practitioner during an expedition between Margate and Nash. Hanbury & Marshall (1899) thought that it might be native (as, indeed, have many British authors in the past) and found that it was not uncommon in hedges and on dry banks, but absent from the Weald, other than Tunbridge Wells. Where habitats are given in their cited records, they include chalk pits, brickfields, roadsides, waste places, hedgebanks and cliffs. A record from Henry Lamb at Boxley is given which, from a specimen in **MNE** (1887), appears to have been from the edge of a lane near Boxley Abbey, which might suggest an older origin from cultivation; the relationship between gardens and wild status seems equivocal at times. Francis Rose had records from Upper Halling (roadside bank on chalk, 1946); Capstone (roadside hedgebank on chalk, 1958); and east of Brook (lane hedgebank on chalk, 1947, 1952) – all very similar habitats.

Philp (1982) gave 19 tetrad records, almost all in the north west of the county, and treated Cat-mint as rather local and scarce, usually on chalk. A sharp decline is shown by the data in Philp (2010), with substantial loss of the north west concentration, not off-set by a small scatter of records elsewhere. Only ten tetrad records are noted, a decline of 47%.

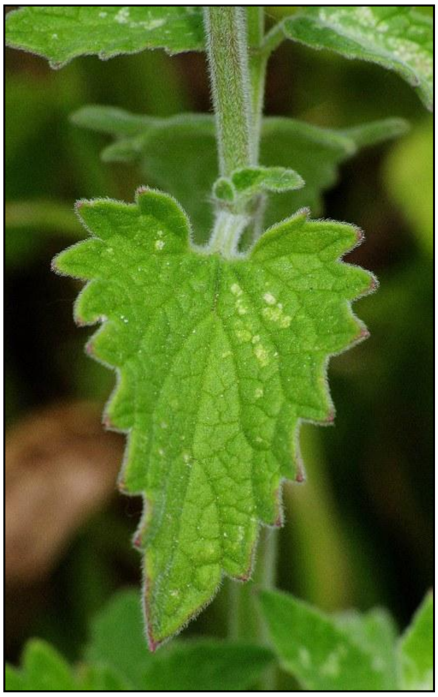
It is apparent, however, that there were further records not known to Eric Philp for the purposes of the 1991-2005 survey, and which show that presence in north west Kent continued. For example, it was present at Crockenhill Lane, Eynsford from 1997 to 1999 (TQ 530 664, Rodney Burton); in a scrap of hedgerow by the path to Hogs Wood, Knatts Valley in 1998 (presumably TQ5563, Joyce Pitt); and six plants below Stone Church in 1995 (TQ577645, John Palmer). Outside that survey period it was known in Lullingstone Park, most recently in 2007 on an earth heap (TQ 5257 6438, Rodney Burton), where it did not persist.

Our 2010-24 records amount to more than given by Philp (2010) but are less than Philp (1982), with only 15 tetrad records, from the same number of monads. Those records include a garage forecourt in Bexleyheath (2010-11); a chalk valley at Luddesdown (23 plants, 2011); a disturbed chalk slope above Holborough (six or seven plants, 2015); the chalk Medway valley slopes above Wouldham (at least 30 plants, 2012); a scattering in several places at the old Conyer brickworks (many plants, 2012-13, also 2021); near Coombe Farm, Wye (one plant, 2010); chalky ground disturbed by roadworks at Burham (2017); a car park at Sole Street (2017); grassy slopes on chalk at Polhill (2018); a car park at Key Street(2019); a road-verge at Harty in Sheppey (2021); and Burham churchyard (2022).

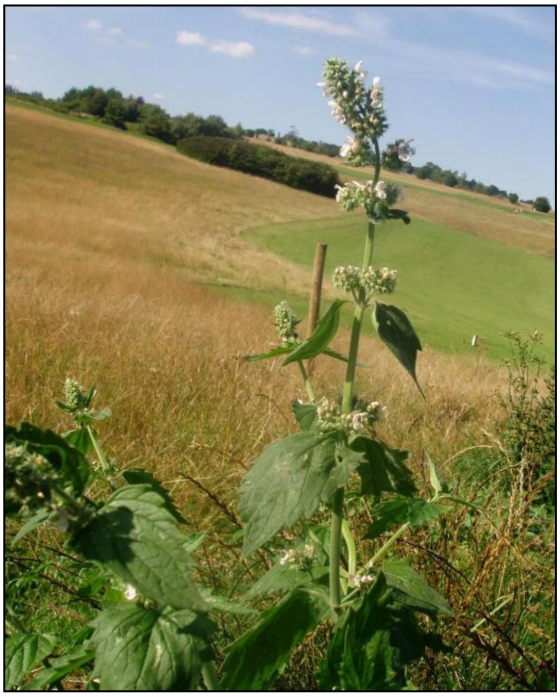


***Nepeta cataria* Kent records to 2024 mapped at tetrad level, from BSBI database.**

It is very much a plant of disturbed ground and often casual only. Whilst it may disappear as a consequence of further disturbance, the longevity of the seed and the likelihood that its germination is staggered offers the prospect of re-appearance. It is unlikely to be confused with other species except, possibly, for *Marrubium vulgare* (White Horehound), which is rarer in Kent. The latter's inflorescence whorls are, however, spaced out along the stem, whereas those of *Nepeta cataria* are terminal. Also, the smell of *Marrubium* is reminiscent of thyme; Cat-mint is, unsurprisingly, minty.



Conyer. Photo by Lliam Rooney, 13 August 2013



Lullingstone Park. Photo by Rodney Burton, 26 August 2007

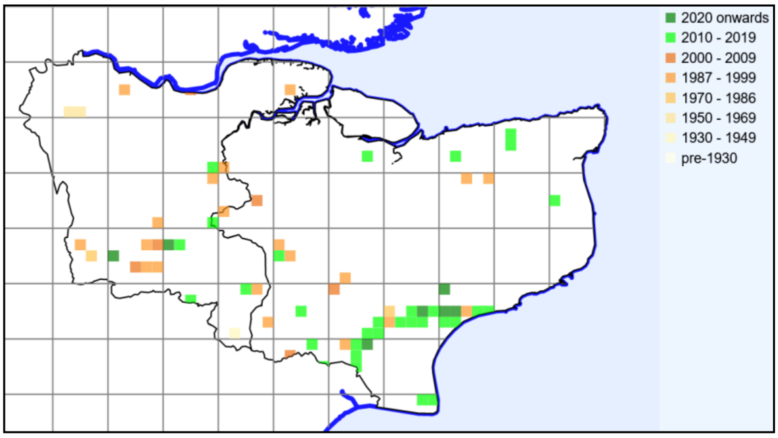
Nymphoides peltata Kuntze (Fringed Water-lily)

vc 15 and 16

Rarity / scarcity status

Nymphoides peltata was included in the rare plant register on the basis that it was listed in the Joint Nature Conservation Committee taxon designation spreadsheet as **nationally scarce**. This designation is based on a plant being recorded in only 16 to 100 hectads (10km squares) in Great Britain. However, the *New Atlas of the British and Irish Flora* (ed. Preston, C.D., Pearman, D.A. & Dines, T.D., 2002) gave *Nymphoides peltata* as present in 441 hectads during the period 1987-99, and the BSBI database gives 575 hectads for 2000-19. It is therefore apparent that any assessment of the species as nationally scarce must be restricted to localities where it is regarded as native. The *New Atlas* treats 30 hectads as of native occurrence (in the Thames basin and the East Anglian fens) and the remaining 411 hectads, including all Kent records, as relating to introductions. *Plant Atlas 2020* (2023) followed a similar course with 538 hectads assessed as introductions and 37 as native, none in Kent. Its conservation risk status in England and in Great Britain as a whole is of 'Least Concern'.

It is not uncommon in Kent. The core distribution area for Fringed Water-lily in Kent is the Royal Military Canal, constructed 1804-09. The species was unknown, there and elsewhere in the county, to Hanbury & Marshall (1899), and the first record on the canal appears to have been in 1959, near Appledore. On the basis that all Kent plants may be assumed to be introduced (subject to the possibility that birds may be responsible for transmission to further sites from introductions elsewhere[459]), there is limited value to the species' inclusion in the rare plant register, and information will be limited to its mapped 2010-24 distribution.



***Nymphoides peltata* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Appledore. Photo by Lliam Rooney, 16 July 2015

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[459] Suggested by Francis Rose as a possibility in relation to a lake (former gravel pit) at Leybourne Castle (specimen, 1955, at **MNE**). It seems that such transmission would have to be by being caught up on the bodies of wildfowl, and not by passage through the digestive tract.

Kent Rare Plant Register
Species accounts Part O-Orc

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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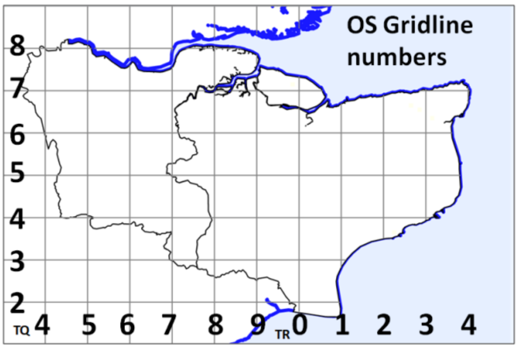
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at **tetrad** (2 x 2km squares) or **monad** (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together)..

Abbreviations used in the text:

Recorders' initials:

AC Andrew Craven
ACH Andrew Henderson
AG Alfred Gay
AH Alan Heyes
AW Tony Witts
BPS British Pteridological Society
BS Bob Smith
CDP Chris Preston
CJ Clive Jermy
CJC & AP James Cadbury & A. Parker
CO Colin Osborne
DM Daphne Mills
DS David Steere
EB Enid Barrie
EGP Eric Philp
FR Francis Rose
GK Geoffrey Kitchener
GT Gill Tysoe
HP Mrs H. Pollard
IB Ian Beavis
JB Jon Bramley
JH Jan Hendey
JP Joyce Pitt
JRP John Palmer
JS Judith Shorter
JW Jo Weightman
KBRG Kent Botanical Recording Group
KFC Kent Field Club
KF-S Kate Fidzcuk-Sterry
KR K.D. Rowlands
LF Lynn Farrell
LH & DH Lorna & Derek Holland
LM Lesley Mason
LNHS London Natural History Society
LR Lliam Rooney
MC Mick Crawley
MF Mary Fuller
MJ M. Jones
MP Mary Page
ND Nick Delaney
NJ Nick Johansson
OL Owen Leyshon
PC P.D. Carey
PG Phil Green
PS Philip Sansum
RC Ray Clarke
RF Rosemary FitzGerald
RHW R.H. Woodall
RM Richard Moyse
RMB Rodney Burton
SB Sue Buckingham
SBu S. Butler
SC Steve Coates
SH Stuart Headley
SL Stephen Lemon
ST Samuel Thomas
TCGR Tim Rich
TM T. Miller
WEC Wally Coultrop

Other abbreviations and references:

BM =Natural History Museum herbarium	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MNE = Maidstone Museum herbarium	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
CGE = Cambridge University herbarium	MoD Ministry of Defence	SLBI = South London Botanical Institute herbarium
Hanbury & Marshall (1899) refers to their *Flora of Kent*		

Oenanthe fistulosa L. (Tubular Water-dropwort)

vc 15 and 16

Rarity / scarcity status

Oenanthe fistulosa is locally frequent in wet places in the British Isles, although almost absent from Scotland. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006, having previously had UK Biodiversity Action Plan priority species status, because of threats from drainage, eutrophication, weed control and conversion to arable. Its conservation risk status in Great Britain as a whole and in England is as **Vulnerable** to the risk of extinction. This, for England, is because its area of occupancy is taken to have declined by 35% in comparing records for the periods 1930-69 and 1987-99. A comparison of Kent records between 1971-80 and 1991-2005 indicates a decline, based on tetrad occurrences, of 60%. Accordingly, whilst the species is neither rare nor scarce in the county, it must be considered as at risk. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first record for Kent is that by Thomas Johnson in his *Descriptio Itineris* (1632), together with a number of other species of marshes and ditches encountered between Sandwich and Canterbury. The route from Sandwich, exiting by the Canterbury Gate, would in those days have been via Ash and Wingham, in the course of which Johnson's botanical party would have passed by ditches associated with the North Poulders Stream, where *Oenanthe fistulosa* is still (2015) present.

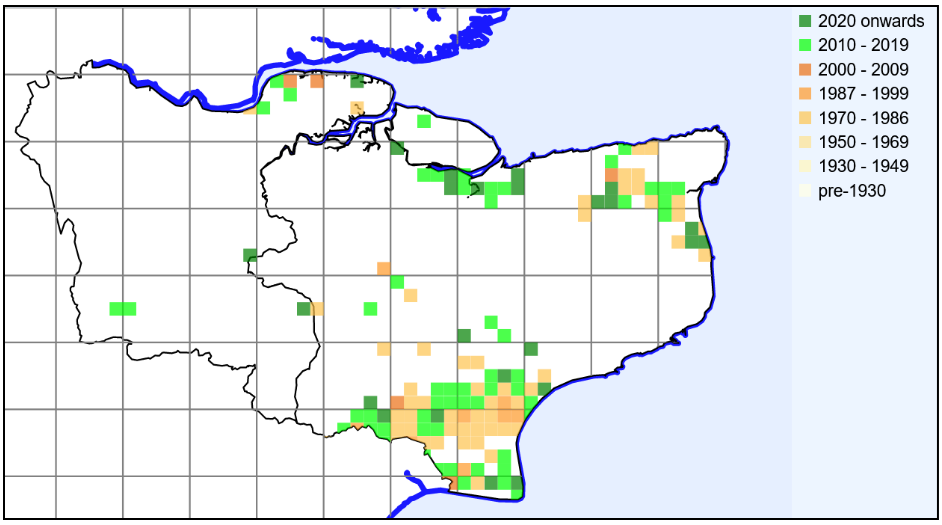
Harty Ferry, Oare. Photos by Lliam Rooney, 6 July 2010

Hanbury & Marshall (1899) obtained records from every botanical district where there were marshy places (so that waterless parts of the North Downs were excluded) and regarded it as 'not very common, though pretty general in its distribution'. In particular, the species was present along the north Kent marshes of the Thames estuary and coast; in the Stour catchment and the levels around Thanet; on Romney Marsh; and inland areas, such as around Ashford (including Hothfield Heath) and stations along the Medway (Snodland, Tonbridge).

Francis Rose recorded it widely in a range of wet habitats, for example: Lower Stoke (brackish marsh, c.1949); Hacklinge Marsh (fen-meadow, 1946); Stodmarsh (marsh dikes, 1949); Sandwich Bay (ditches at rear of dunes, 1954); Fordwich (alluvial marshes, 1954); Gibbin's Brook (weakly acid bog / marshy pond edge on Gault, 1954); Sandhurst levels (alluvial marsh dikes, 1954). In the Romney Marsh area, including this last record, he noted it in seven hectads, as a plant of brackish, calcareous and weakly acid waters, usually stagnant. The 1971-80 survey (Philp, 1982) showed Tubular Water-dropwort to be 'Rather local although quite frequent in some coastal areas' and gave 104 tetrads, mostly in Romney

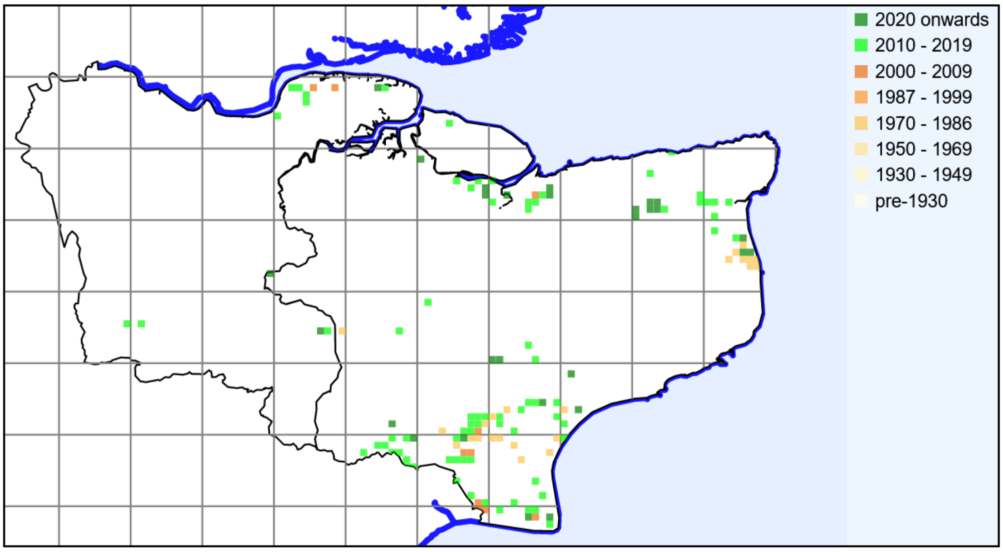
Marsh and the levels around Deal, Sandwich, Ash and the Wantsum. The 1991-2005 survey (Philp, 2010) indicated a remarkable reduction in those core areas, with only 42 tetrads recorded, the species being found in emergent and fringing vegetation in marsh dykes near the coast, and occasionally in similar habitats by ponds and rivers further inland.

No cause was assigned by Philp (2010) to this apparent decline. Records for 2010-24 amount to 80 tetrads (equivalent to 104 monads), so that Philp (2010) appears to have been overstating the change. The remaining losses are mostly at Romney Marsh, where in the past the species appears to have been fairly ubiquitous, but also on the low ground west of Thanet. In these respects, there are similarities with the losses of *Hydrocharis morsus-ranae* (Frogbit) – see the account for that species – which might represent under-recording or reflect conversion from grazing to arable.



***Oenanthe fistulosa* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Our 2010-24 records are best viewed at the higher resolution of the monad distribution map below. This has fewer historic records, as monad recording only became the norm in Kent from 2010. The historic monad records in this instance are largely due to intensive ditch surveys, 1981-86.



***Oenanthe fistulosa* Kent records to 2024 mapped at monad level, from BSBI database.**

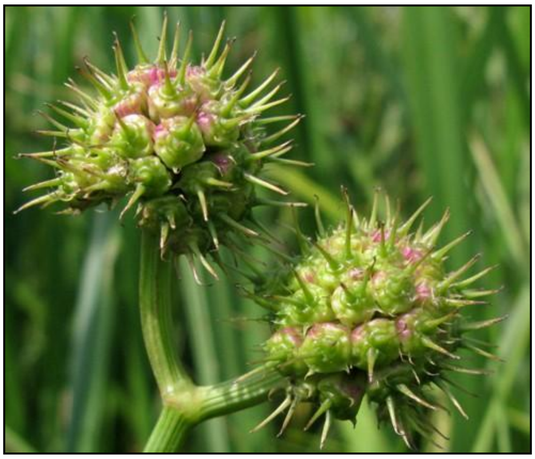
Oenanthe fistulosa favours seasonally flooded ground subject to grazing or cutting regimes which reduce the effect of more vigorous competitors. Nevertheless, it appears more resistant than many plants to changes in land use affecting its habitat. An experiment was undertaken at Romney Marsh in the 1980s, seeking data as regards the effect on ditch flora of change from adjoining pasture use to arable. A ditch in arable land was cleared and species typical of shallow pasture ditches were introduced in order to ascertain how they would fare. All were well established a year after introduction, but disappeared within three years once the adjoining land was sown to rape, having previously been used for cereals, except that *Oenanthe fistulosa* survived and spread.

It is therefore unlikely that such land use change alone might cause significant deterioration, unless the effect is to bring about domination by *Phragmites australi*s (Common Reed), with which few species can compete[460]. There is potential for *Oenanthe fistulosa* to be affected by changes in drainage, given that our Kent records appear mostly to relate to ditches and dyke margins where there are changes in water level with winter flooding.

The flora accompanying *Oenanthe fistulosa* varies, and Alex Lockton has noted it in a variety of plant communities at Stodmarsh National Nature Reserve, being often abundant in A3 *Hydrocharis morsus-ranae* (Frogbit) ditches, MG13 *Alopecurus geniculatus* (Marsh Foxtail) grassland, and S5 *Glyceria maxima* (Reed Sweet-grass), S6 *Carex riparia* (Greater Pond-sedge), S13 *Typha angustifolia* (Lesser Bulrush) and S22 *Glyceria fluitans* (Floating Sweet-grass) swamps.

Seasalter levels, habitat. Photo by Lliam Rooney, 23 June 2014

Tolerance of brackish conditions may be influenced by *Oenanthe fistulosa* being affected by arbuscular mycorrhizal fungi (more so for emergent rather than submerged growth), which should have a beneficial effect in uptake of nutrients and plant growth[461].



Stodmarsh, globose fruiting heads. Photo by Sue Buckingham, 30 July 2014

Oenanthe fistulosa may be separated from other *Oenanthe* species by:

- its somewhat inflated hollow **stems** (those of *O. lachenalii* and *O. pimpinelloides* are solid, with pith);

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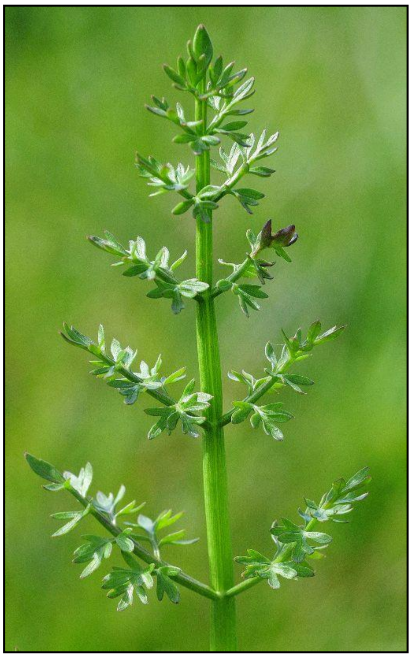
[460] Although it should be noted that, on a national basis, most sites from which *O. fistulosa* has disappeared in recent times were water margin habitats which had become choked by tall dense vegetation as a result of a lack of grazing or a cessation of ditch clearance (Walker, K.J., Stroh, P.A. & Ellis, R.W. (2017), *Threatened plants in Britain and Ireland*, Botanical Society of Britain and Ireland, Bristol).

[461] Šraj-Kržič, N., Pongrac, P., Klemenc, M., Kladnik, A., Regvar, M. & Gaberščik, A. 2006. Mycorrhizal colonisation in plants from intermittent aquatic habitats. *Aquatic Botany* **85**:331-336.

- the absence of **bracts** (as distinct from bracteoles), a character shared by *O. silaifolia*, but not by *O. crocata*, *O. lachenalii* and *O. pimpinelloides*
- its ultimate clusters of fruit being globose with all fruits sessile (not so, with *O. crocata*, *O. silaifolia*. *O. pimpinelloides* and *O. lachenalii*);
- the fruits being less than 4mm long (more, with *O. crocata, O. fluviatilis*).

O. aquatica may be separated by its thick shiny stems and finely divided leaves.

In practice, the species to distinguish most carefully are *O. fistulosa* and *O. lachenalii* because of their overall similarity and frequent overlap of habitat and distribution; they have been recorded as growing together, e.g. in ditches inland of Greatstone / Lydd-on-Sea.



Hernhill. Basal leaf; photo by Lliam Rooney, 22 April 2012

Oenanthe fluvialitilis (Bab.) Coleman (River Water-dropwort)

vc 15 and 16

Rarity / scarcity status

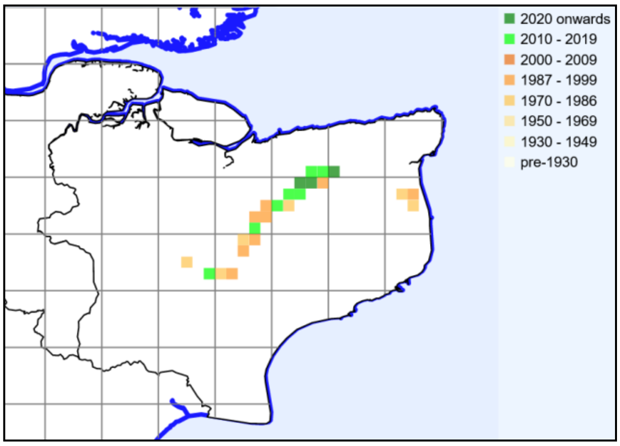
Oenanthe fluviatilis is a perennial of slow-flowing watercourses, mostly in south east England. Its threat status for England and Great Britain as a whole is one of 'Least Concern', but it is **nationally scarce**. In Kent it is verging on **scarce**, and is confined to the River Stour and formerly (if not still) its tributary streams from Worth/Hacklinge.

River Stour, Canterbury.
All photos by Lliam Rooney, 2 August 2014

Account

In *The Botanist's Guide through England and Wales* by D. Turner and L. Dillwyn (1805), there is mention of 'CICUTA *virosa*. In running water at Canterbury and Ashford. *Mr. W. Borrer.jun*.'. This, it later transpired, was actually *Oenanthe fluviatilis*, but a quite understandable mis-identification by the young William Borrer, then in his twenties, given that *Oenanthe fluviatilis* was not described as a species until 1844 [462]. Hanbury & Marshall (1899) regarded the species as a very local plant confined to East Kent and gave records for it near Ashford, between Chartham and Canterbury, and between Stodmarsh and Grove Ferry, all presumably Stour-related. Hanbury saw it at Worth, Ham Ponds and a ditch at Hacklinge, all relating to the East Kent fens forming part of the Stour catchment. Marshall saw it at Sandwich (probably the town ditch, where still present in 1946).

Franci Rose noted it c. 1950 as a native of running water of rivers and streams, very local in seven hectads, and confined to the River Stour and its side-streams from above Hothfield to Stodmarsh; also in the fens and marshes from Sandwich to Hacklinge, in which localities it was abundant (although more recently no longer seen there). He found that it does not flower freely everywhere, but usually does so in the shallow slow-moving part of the Stour at Shalmsford Street and at Milton Bridge, Thanington. For 1971-80, Philp (1982) also located records in seven hectads, and these were for 21 tetrads covering the Great Stour and adjoining marshes, including one south of Sandwich; plants were locally common in some parts of the river. The reduction to 16 tetrads in the 1991-2005 survey (Philp, 2010) may indicate actual decline. Any losses seem largely to relate to the upper reaches of the Stour. A 1996 record for the Rother catchment in the BSBI database appears to be an input error, as it is given neither in Philp (2010) nor Eric Philp's recording card and so is now marked 'doubtful' and not mapped



***Oenanthe fluviatilis* tetrad records to 2024 from BSBI database**

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[462] Described by W.H. Coleman (1844). Observations on a new species of *Oenanthe*. *Annals and Magazine of Natural History* **13**: 188-191. C.C. Babington added a note to this paper referring to Borrer's find. Babington had already suggested, in his *Manual of British Botany* (1843) at p.131, that the plant, as found by Coleman in Hertfordshire might warrant treatment as a separate species from what is now *Oenanthe aquatica*.

Our recent records (2010-24) are concerning, as they amount to only nine tetrads (12 monads). This trend of apparent decline is shown in the accompanying distribution map of tetrad records to 2024. Complete loss from the East Kent fens lacks an obvious explanation and there is the possibility that it has been overlooked, in which case the addition of this species to the rare plant register in 2022 may assist in encouraging search. Losses in the Stour might be thought to be an issue of water quality, but in that case it is surprising that losses increase upstream; also, *O. fluviatilis* appears to have some tolerance of eutrophication.[463] It may be that it has been overlooked here as well, or there may be other factors at work, such as dredging.

O. fluviatilis is most often present in a vegetative state submerged in flowing water, where it trails its foliage (of which the leaf-segments are more linear than the emergent form) in masses much as does *Ranunculus penicillatus* subsp. *pseudofluitans* (Stream Water-crowfoot), with which it may be growing. It is less likely to flower where the current is strong, preferring locations where the current is held up; and it appears that, although it may grow sterile for a number of years, flowering and fruiting may be followed by death. Spread can be by seed but is most commonly through fragmentation, as pieces of leaf and stem break off and are carried downstream to root where they settle.[464]

It is distinguishable from *Oenanthe crocata* (Hemlock Water-dropwort) in that the latter is a water-marginal plant, rather than one which is submergent/emergent, and *Oenanthe crocata* has stouter stems and solid petioles. From *Oenanthe aquatica* (Fine-leaved Water-dropwort) it is distinguishable as not being so 'Fine-leaved', both as regards submergent and emergent leaves, those of *O. aquatica* being parsley-scented and those of *O.*

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[463] Robach, F., Thiébaut, G., Trémolière, M. & Muller, S. (1996). A reference system for continental running waters: plant communities as bioindicators of increasing eutrophication in alkaline and acidic waters in north-east France. *Hydrobiologia* **340**: 67-76.

[464] Information in this paragraph is derived principally from:

(1) Issler, e. & Walter, E. (1928). Une plante longtemps méconnue; *Oenanthe fluviatilis* (Babington) Coleman. *Bulletin de la Société Botanique de France* **75**:68-73

(2) Southam, M.J. (1994). *Oenanthe fluviatilis* (Bab. Coleman, in (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC

fluviatilis being celery-scented; as growing in flowing waters rather than still waters or drying-out habitats;and as having a less erect stem with more internodes.

Records from Philp (1982) are not included in this table. They are covered within the distribution map above and carry no more information than the tetrad grid reference.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Godinton Park	TQ94W, includes TQ9942		(1) 31 August 2018 (2) 1991-99	(1) LR & JB (2) EGP	(1) TQ9942. (2) TQ94W.
Willesborough Lees	TR04G		1991-99	EGP	TR04G.
Wye	TR04N, includes TR0446		(1) 1991-99 (2) 26 July 1991	(1) EGP (2)TCGR	(1) TR04N. (2) TR 048 469, Great Stour.
Bilting	TR04P		1991-99	EGP	TR04P.
Godmersham	TR04U		1991-99	EGP	TR04U.
Godmersham	TR05Q, includes TR0650, TR0651		(1) 1 August 2014 (2) 1991-99 (3)27 September 1987	(1) LR (2) EGP (3) CDP	(1) TR0651. (2) TR05Q. (3) TR 062 505, Great Stour.
Chilham	TR05R, includes TR0753		(1) 1991-99 (2) 26 July 1991	(1) EGP (2)TCGR	(1) TR05R (2) TR 075 532, Bagham, Great Stour.
Chilham east	TR05W		1991-99	EGP	TR05W.
Shalmsford Street	TR05X		1991-99	EGP	TR05X
Chartham	TR15C, includes TR1155		(1) 31 October 2011 (2) 1991-99	(1) SB (2) EGP	(1) Abundant in Great Stour at TR 11893 55773. (2) TR15C
Thanington	TR15I, includes TR1356, TR1357		(1) 18 July 2014 (2) 1991-99 (3) 26 July 1991	(1) LR (2) EGP (3)TCGR	(1) TR1357. (2) TR15I. (3) TR 132 569, Great Stour.
Canterbury	TR15N, includes TR1457		(1) 18 July 2014 (2) 1991-99	(1) LR (2) EGP	(1) TR1457 (2) TR15N.
Canterbury north	TR15P, includes TR1458, TR1558		(1) 9 March 2022 (2) 2 July 2021 (3) 15 June 2021 (4) 2 August 2014 (5) 1991-99	(1)AL & JM (2) EB (3) CO (4) LR (5) EGP	(1) TR 146 581. River Stour in Canterbury. Abundant in shallow water near Westgate; plants green but hugging the bottom of the channel. (2) TR1458. River Stour & water channels (3) TR1458, TR1558. (4) TR1458. (5) TR15P.
Fordwich, includes TR1659, TR1759	TR15U		(1) 14 June 2022 (2) 11 June 2021 (3) 8 June 2021 (4) 30 May 2015 (5) 25 July 2013 (6) 7 July 2013 (7) 1991-99	(1)AL (2) CO (3) CO (4) CO (5) CO (6) CO (7) EGP	(1) TR 177 598. Abundant in the river; flowering. (2) TR1659. (3) TR1759. (4) TR1759. Usual sites but much reduced and just breaking prior flowering but raft race due 6th June. (5) TR1759, Along main river channel between Fordwich bridge and Sturry bridge, Common. (6) Regular patches in river both sides of bridge at TR 163 598 Common. (7) TR15U.
Fordwich east	TR15Z		1991-99	EGP	TR15Z.
Sturry	TR16Q, includes		(1) 16 June 2017	(1) CO	(1) TR1760. In main river Great

	TR1760.		(2) 1991-99	(2) EGP	Stour. (2) TR16Q.
Sturry	TR1860		(1) 23 September 2014 (2) 24 June 2013	(1) CO (2) CO	(1) In river by bench, one patch. (2) In river, one plant.
Sturry	TR1960		18 June 2015	CO	On river, one patch.
Stodmarsh	TR2060	SSSI	22 July 2022	AL & KF-S	TR 2028 6051. Higham Farm, ditch survey.
Worth Minnis	TR3356		1982	ACH	North of Worth Hill.
Worth Minnis	TR3356		1982	ACH	
Worth Minnis, north east	TR35N,includes TR3546,TR3547		(1) 1991-99 (2) 1982	(1) EGP (2) ACH	(1) TR35N (2) TR3546, TR3547
Lydden valley	TR3355		1982	ACH	TR3355

Oenanthe lachenalii C.C. Gmel. (Parsley Water-dropwort)

vc 15 and 16

Rarity / scarcity status

Oenanthe lachenalii is scattered but widespread in coastal areas of the British Isles, more or less absent from the north east coast and east Scotland. Whilst its conservation risk status in Great Britain as a whole has been one of 'Least Concern', a more recent assessment for England has identified the species as **Near Threatened**. This is because its area of occupancy in England is taken to have declined by 24% in comparing records for the periods 1930-69 and 1987-99. A comparison of Kent records between 1971-80 and 1991-2005 indicates a decline, based on tetrad occurrences, of 41%. It is neither scarce nor rare in Kent. It is a Kent axiophyte and so is indicative of good habitat.

Account

As with *Oenanthe fistulosa* (Tubular Water-dropwort), the first Kent record was published by Thomas Johnson in his *Descriptio Itineris* (1632). *Oenanthe lachenalii*, however, was found on a different route, from Margate to Sandwich, and in a more coastal habitat, although before reaching the seashore. The journey would have taken Johnson by Pegwell Bay and the former shingle beach of Stonar, now quarried away. The species is still present (2021) by the south part of Pegwell Bay (TR3462).

Sandwich Bay. Photo by Lliam Rooney, 20 July 2011

The distribution of *Oenanthe lachenalii* seems always to have been similar to that of *O. fistulosa*, but the former is more tolerant of brackish conditions, and less likely to be found inland. Hanbury & Marshall (1899) regarded it as locally abundant in marshes, especially near the sea. They cited records scattered along the north Kent estuarial or coastal marshes, by the tidal Medway near Burham, in north east Kent at Pegwell Bay and Sandwich; and Marshall saw it in plenty near Appledore. Most records were in the Romney Marsh area.

Sandwich Bay. Photo by Lliam Rooney, 20 July 2011

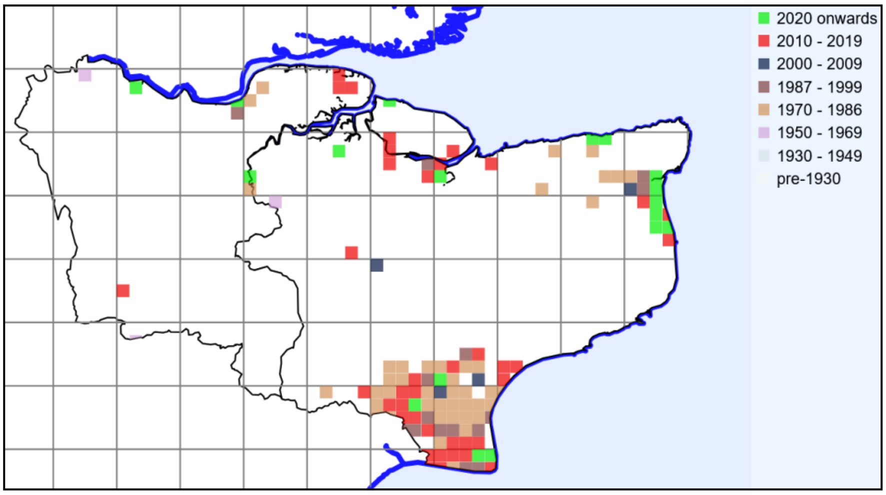
This general distribution continued with Francis Rose's findings: the species was still in brackish meadows at Burham (1953) as well as, on the west side of the river, Holborough marshes (1944) and more or less brackish marshes south of Snodland. Along the north coast it was at Higham and east of All Hallows (brackish marsh dike edges, 1944 and 1954); in north east Kent at Stodmarsh (swampy fen-meadow, 1955), Chislet (by alluvial marsh dikes, 1952) and north of Sandwich (dunes behind marsh, 1946); in south east Kent it was found by springs on an old sea cliff at Oxney (1958), near Dymchurch in damp, brackish, sandy ground behind the sea wall (1947) and at Potmans Heath in old clay pits (1958).

Philp (1982) recorded it in 71 tetrads, with the same general distribution, most densely in Romney Marsh, as a plant of marshes and damp meadows on clay soils, particularly near the coast, where it was locally frequent. The survey of 1991-2005 (Philp, 2010) showed considerable thinning out, and a reduction to 42 tetrads

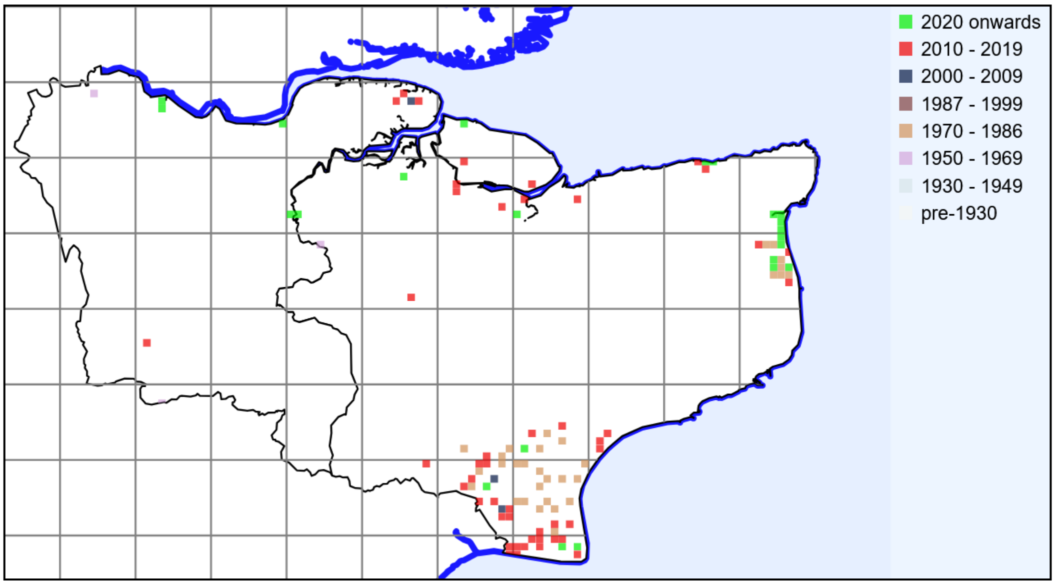
Crayford Marshes, habitat. Photo by Geoffrey Kitchener, 23 July 2020

Our 2010-24 records amount to 57 tetrads (70 monads), so that the decline is not so much as might have been supposed. It is clear from the tetrad distribution map below that the difference may be accounted for in Romney Marsh and the Ash levels, whether through actual decline or insufficiency of recording. Anomalous inland records are slightly less common than with *O. fistulosa* but occur, nonetheless: in 2015 it was recorded by Brian Woodhams in damp grassland in the Len valley south of Harriesham, and in 2013 a Kent Field Club meeting found it in the Eden valley, cow-trodden marshy ground near a field edge (determined by Rodney Burton).

Oenanthe lachenalii Kent records to 2024 mapped at tetrad level, from BSBI database.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

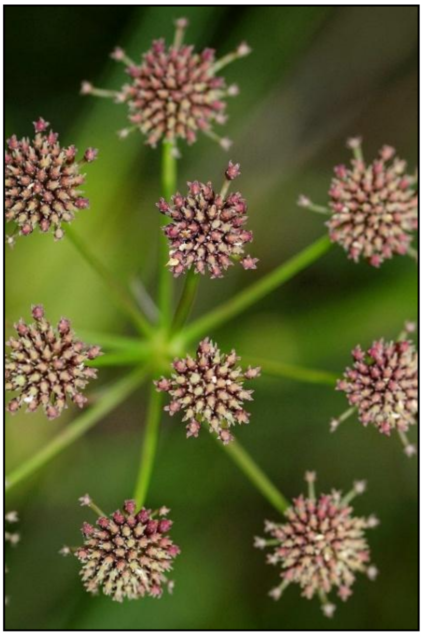
Our 2010-22 records are best viewed at the higher resolution of the monad distribution map below. This has somewhat fewer historic records, since monad recording only became the norm in Kent from 2010. The historic monad records in this instance are largely due to intensive ditch surveys, 1981-86, as with *Oenanthe fistulosa*.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Oenanthe lachenalii Kent records to 2024 mapped at monad level, from BSBI database.

Tolerance of brackish conditions may be influenced by *Oenanthe lachenalii* being strongly affected by arbuscular mycorrhizal fungi, which should have a beneficial effect in uptake of nutrients and plant growth[465].

Parsley Water-dropwort is characterised by solid stems (with pith), and rays and pedicels scarcely thickened in fruit.



Sandwich Bay. Photo by Lliam Rooney, 20 July 2011

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[465] Hildebrandt, U., Janetta, K., Ouziad, F., Renne, B., Nawrath, K. & Bothe, H. (2001). Arbuscular mycorrhizal colonization of halophytes in Central European salt marshes. *Mycorrhiza* **10** : 175–183.

Oenanthe silaifolia M. Bieb. (Narrow-leaved Water-dropwort)

vc 15 and 16

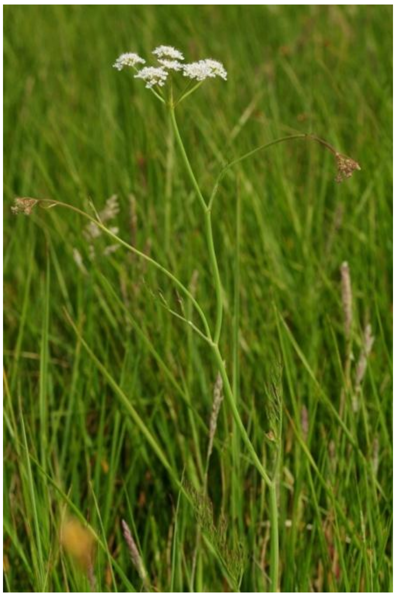
Rarity / scarcity status

Oenanthe silaifolia is a plant of damp floodplain meadows and stream-sides, scattered in south east and central England, absent from Scotland and Ireland. It is a **nationally scarce** species but its conservation risk assessment is of 'Least Concern' in both Great Britain as a whole, and in England, the latter on the basis that no significant and substantial (greater than 20%) decline had been identified. Ostensibly, there has been a decline of 43% in Kent between 1971-80 and 1991-2005, but this is not fully borne out by subsequent investigations, although it remains **scarce** in the county.[466]

Seasalter levels. Photo by Lliam Rooney, 2011

Account

The first Kent record of Narrow-leaved Water-dropwort is in G.E. Smith's manuscript notes of 1829-33, in which the plant is said to be 'By the canalbanks in several places between Seabrook & Appledore'. It has not been seen anywhere near there since, and there are other *Oenanthe* species present, so there may be an issue of identification. Other early records were at a roadside between Sheerness and Queenborough (1855, J.T. Syme), in marshes at Sarre (1847); and abundant in wet meadows near the Eden below Chiddingstone (Marshall in Hanbury & Marshall, 1899). This last find presumably prompted Marshall's observations: 'Occurring mostly in meadows, and flowering when the hay is about ready to be cut, *O. silaifolia* is very liable to be passed by. The finely divided early root-leaves, which wither before it blossoms, are quite unlike those of our other Water-dropworts, and it is a perfectly distinct species'. Hanbury & Marshall (1899) had no other records, and treated the species as very rare, unless overlooked, in fresh-water marshes.



Seasalter levels. Photo by Lliam Rooney, 1 June 2011

It has remained recorded in very few areas There have been further finds in Sheppey (from a marsh near a stream at Minster, Trudy Side, 1965, and in the Scrapsgate area) and at Harty (Joyce Pitt, 1991), and across the Swale on the mainland, at the damp meadows of the Seasalter levels, where it grows in abundance. But undoubtedly the core distribution area has been in the Eden valley and along the Medway below its confluence with the River Eden. There are specimens in **MNE** collected by Francis Rose from alluvial meadows by the River Eden both west of Edenbridge (1947) and east (1958), including in a hay meadow at Delaware (1950); and in meadows west of Penshurst, where abundant (1944). After the Eden joins the Medway, Clive Stace recorded it in the 1950s and 60s in a meadow south east of Leigh and in a ditch just north of the Straight Mile by the path to Leigh. More recent records are given in the table below and include a count of 300 plants (2023) in the low-lying grassland west of the Leigh flood barrier, an area subject to autumn/winter flooding.

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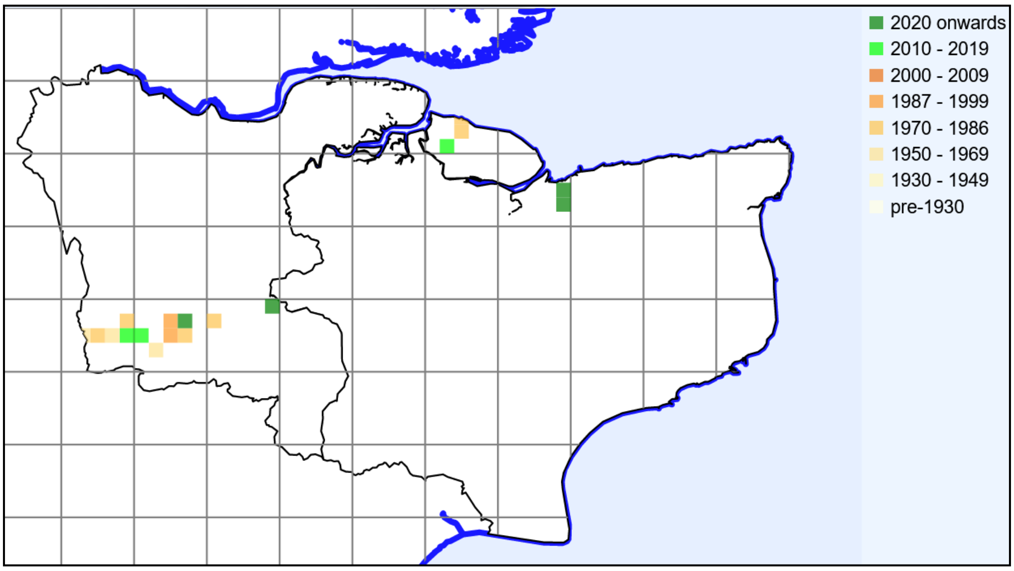
[466] The record in M.H. Cowell's *A Floral Guide for East Kent* (1839) is taken from the same source.

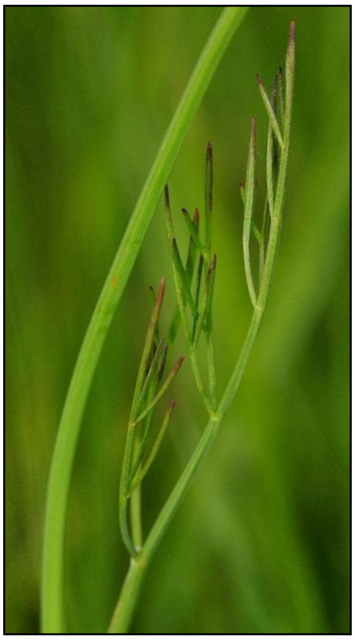
Philp (2010) described the species as rare and decreasing, in damp meadows that usually flood in the winter months, with only four tetrad records for 1991-2005, in comparison with seven for 1971-70 (Philp, 1982). However, with seven tetrad records made in the period 2010-23 (10 monads), recent decline has not been substantiated, and there may yet be scope for more re-finding in the Edenbridge to Tonbridge area. Mapping shows how much rarer this is than the other *Oenanthe* species in this register. Our recent records follow Southam (1991)[467] in being of isolated or scattered plants, not in dense stands.

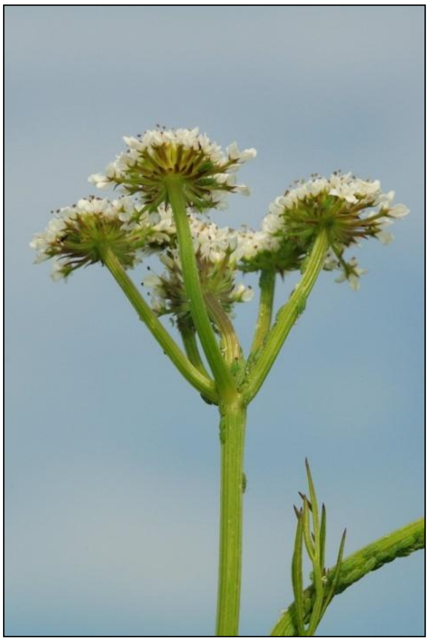


***Oenanthe silaifolia* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Sightings in low-lying hay meadows are, as Marshall found, obviously dependent on being made before cropping; sightings in similar pasture are generally reliant on light or interrupted grazing, or are of plants with a degree of protection.

Oenanthe silaifolia has stems which are hollow at maturity with thin walls; all leaflets narrow and pointed; generally no bracts; fruits not exceeding 3.5mm, with styles almost as long; rays and pedicels thickening in fruit.





Seasalter levels. Photos by Lliam Rooney, 1 June 2011

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[467] Southam, M.J. (1991). *Oenanthe silaifolia* – a scarce British umbellifer. *BSBI News* **58**:9-10.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Edenbridge	TQ4445		Between 1980 and 1986	FR	TQ 441 453.
East of Edenbridge	TR4545		Between 1970 and 1986	FR	TQ 458 458. Probably where also recorded by FR in 1950.
Chiddingstone	TQ4945		7 June 2015	SL	TQ491457 / TQ492457, marshy field corner (now dry underfoot), c. 50 flowering plants in several loose patches in *Juncus* dominated areas.
Chiddingstone	TQ44Y		After 1970, before 1981	Philp (1982)	
Chiddingstone	TQ5045		29 June 2016	ST (det. JP)	TQ 50314 45804, occasional to frequent towards the back of the Eden floodplain meadow at Somerden Farm, this being lower away from the channel and so wetter. Associated spp. *Ranunculus flammula*, *Achillea ptarmica*, *Juncus spp.* Material coll. 29 June, but found earlier in the year.
Chiddingstone, Vexour Bridge	TQ5145		(1) 8 June 2019 (2) 12 June 2016 (3) 3 May 2014 (4) 16 June 2012 (5) 14 May 2011 (6) 14 June 2010	(1) (2) (3) (4) & (5) SL (6) GK	(1) Moorden, Chiddingstone Causeway, formerly wet field corner near River Eden, TQ 517 458 / TQ 516 458. Flowering in good numbers. (2) Moorden Meadow LWS (SE21), marshy field corner now being significantly drained following surrounding ditches being deepened last year, TQ 51690 45916. Plant now flowering in large numbers around edge of marshy area, higher than in previous years, most likely attributable to the cessation of grazing. (3) TQ 516 459 to TQ 517 458, about a dozen non-flowering plants, mostly at eastern end of flooded area, corner grazed by cattle, west of Moorden, by River Eden. (4) 102 flowering *O. silaifolia* in and around the *Carex nigra* flooded field corner at TQ 516 458 and TQ 517 458 and a further 42 flowering *O. silaifolia* in the field at Vexour Bridge at TQ 510 456 and TQ 511 456. (5) 45 plants in flower in the first meadow downstream of the bridge, centred c. TQ 510 456, TQ 511 456 and TQ 511 457. Also a half dozen flowering plants in the wet field corner centred c. TQ 516 458 and TQ 517 458, but cows were grazing this group of fields down and the only surviving plants are those protected by rush /

					spearwort tussocks. (6) (a) marshy field corner and surrounding pasture: (1) 2 plants at TQ 51661 45886 (2) 1 plant at TQ 51662 45900, (3) 2 plants in marsh at TQ 51669 45918, (4) 3 plants at TQ 51662 45885, (5) 63 plants centred on TQ51713 45874 [full count limited by presence of bull]. (b) Large hayfield near Vexour Bridge: (1) 6 plants from TQ 51201 45724 to TQ 51224 47739, (2) 1 plant at TQ 51160 45798, (3) 2 plants at TQ51166 45803, (4) 1 plant at TQ 51137 45798, (5) 1 plant at TQ 51141 45759, (6) 23 plants centred on TQ 51142 45745, (8) 13 plants centred on TQ 51131 45727, (9) 1 plant at TQ 51126 45567, (10) 1 plant at TQ 5116 4579.
East of Penshurst	TQ5344		12 June 1992	JP	TQ 536 441 (Medway floodplain).
Leigh	TQ54M, N (includes TQ5456, TQ5546)		(1) Between 1991 and 1999 (2) July 1986 (3) 14 June 1986 (4) After 1970, before 1981	(1)EGP (Philp, 2010) (2) RF & JP (3) RF (4) Philp (1982)	(1) TQ54M, N. (2) TQ 549 460, near R. Medway, Leigh. (3) TQ 552 460. (4) TQ54N.
Leigh / Haysden	TQ54S		After 1970, before 1981	Philp (1982)	
Haysden	TQ54T (includes TQ5646)		(1) Mayt 2023 (2) 9 June 2022 (3) 8 August 2021 (4) 1 June 2021 (5) 16 June 2010 (6) Between 1991 and 1999 (7) 12 June 1972	(1) AH (2) KBRG meeting (3) SL & SBu (4) AH (5) SB (6) EGP (Philp, 2010) (7) RC	(1) Scattered patches of the plant lie immediately west of the A21 road viaduct that crosses the water meadow. In late May some 300 plants in flower were recorded in number significantly greater than 2022 (around 200 plants in flower counted) and covering a larger area. A few plants were also observed growing for the first time along the edge of the water meadow. The area immediately west of the road viaduct usually floods in autumn/winter and did so 2022-23. (2)Patch of plants beneath the A21 road bridge at TQ 5618 4608. (3) Leigh Flood Barrier, TQ 5638 4609. Single short plant in flower in mown turf on embankment along barrier. (4) TQ 56163 46082, c. 50 plants. TQ 56175 46084, c.100 plants. TQ 56165 46074, eight plants. TQ 56160 46076, seven plants. TQ 56138 46083, c. 30 plants. All in water meadow by Medway behind Leigh flood barrier, flowering. (5) (a) TQ 56118 46089, 9 plants in Medway floodplain grassland with *Phalaris arundinacea*, Country

					Park. (b) TQ 56130 46086, Country Park, 60 plants in Medway floodplain grassland with *Filipendula ulmaria* and *Lythrum salicaria*. (c) TQ 56174 46093 Country Park. 2 plants in Medway floodplain grassland very close to A 21 road bridge (6) TQ54T. (7) TQ 561 460, Medway junction.
East of Tonbridge	TQ64D		After 1970, before 1981	Philp (1982)	
Hale Street	TQ6849		(1) 23 May 2020 (2) 1999 (2) 1986 (3) 12 June 1983	(1) SL (2) AC & JP (2) FR (3) JP	(1) Hale Street, small field east of Medway View and railway, TQ 6837 4923. Scattered flowering plants mostly on western and southern sides of the field in rank grassland slowly scrubbing over. (2) TQ 684 493. (2) TQ683 493, East Peckham. (3) TQ 684 493.
Smarden	TQ8842		6 July 2004	JS	By pond, TQ 88314 42921.
Queenborough, Sheppey	TQ9271		23 June 2014	LM	TQ 922 712. Associated plants were *Carex divisa, Hordeum secalinum, Ranunculus sardous, Lathyrus nissolia, Alopecurus geniculatus, Galium palustre, Rapistrum rugosum* and (rare) *Polypogon monspeliensis*.
Scrapsgate, Sheppey	TQ9474		1986	FR	TQ 940 747
South Scrapsgate / Minster, Sheppey	TQ97L		After 1970, before 1981	Philp (1982)	
Seasalter	TR0863, TR0963	SSSI, RSPB reserve	(1) 21 May 2022 (2) 31 May 2011	(1) AL (2 LR	(1) TR 0900 6389, grassland. (2) TR 09024 63861 to TR 08814 63928, hundreds of plants filling a wet grazing meadow off Seasalter Lane.
Seasalter	TR0864, TR0964	SSSI, RSPB reserve	(1) 28 May 2022 (2) 6 July 2011 (3) 1 June 2011 (4) 25 May 1999 (5) 7 June 1995 (6) Between 1991 and 1999	(1) AL (2) CJC & AP (3) LR (4) JP (5) JP (6) EGP	(1) (a) TR 088 642, frequent in this compartment. (b) TR 0901 6428. Seasalter Level. Typical grassland. (2) Present on Seasalter RSPB reserve in field B (c. TR 087 642, where scarce), field D (c. TR 080 641, where rare), field N (c. TR 084 642, where 4 plants). Not recorded in field C, where locally frequent in July 2008 (TR 0862 6426). (3) TR0864 and TR0964. Meadow off Seasalter Lane. Scattered plants, 20+, more or less confined to straight wet gullies that went across the field. (4) TR 082 643. (5) TR 085 640. (6) TR06X, damp grazing marsh, maybe one of these monads.

Haysden, habitat. Photo by Alan Heyes, 1 June 2021

Omalotheca sylvatica (L.) Sch. Bip. & F.W. Schultz (*Gnaphalium sylvaticum* L.) (Heath Cudweed)

vc 15 and 16

Rarity / scarcity status

Although Heath Cudweed has many historic records across the British Isles on open dry acidic ground, it has declined substantially and is regarded as **Endangered**, both in England and in Great Britain as a whole. This decline also appears to be occurring in Kent, although it does not qualify for local scarcity status. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first Kent record for Heath Cudweed was made by Thomas Johnson in the course of his journey of 1623 (published as *Descriptio Itineris Plantarum*), where the plant is listed amongst those recorded on approaching Canterbury from Sandwich (Francis Rose remarks in the 1972 edition of this work that the species was known to him as still occurring in the woods to the east of the city). Hanbury & Marshall (1899) described the species as not uncommon in woods, heaths and rough grassy places, although woodlands appear to be the most frequently cited habitat. So in Kent, 'Heath Cudweed' is perhaps an inappropriate name, because of the county's lack of heathland. The Latin name, *Omalotheca sylvatica* (= Wood Cudweed) is much more appropriate.

Francis Rose treated it as a native of dry open woods, heaths, grass-heaths, dry fields, old quarries, on sand and gravel and on gravelly-loam soils; locally common on the Eocene deposits, the Pliocene, and the Lower Greensand (Folkestone Sand and cherty plateau soils of Hythe Beds) – rare in the High Weald, absent from the Weald Clay, the marsh districts and the coast. He knew it in the 1940s and 1950s in localities such as Chartham (by a track in a dry wood on Thanet sand); Fawke Common (old chert pits); Elham (in dry open coppiced woodland); Teston (by a woodland track on acid sandy loam); north of Penshurst Park (in a dry wood on Tunbridge Wells Sand); on the Isle of Oxney (in woodland on Ashdown Sand and on sandy soil in coppice).

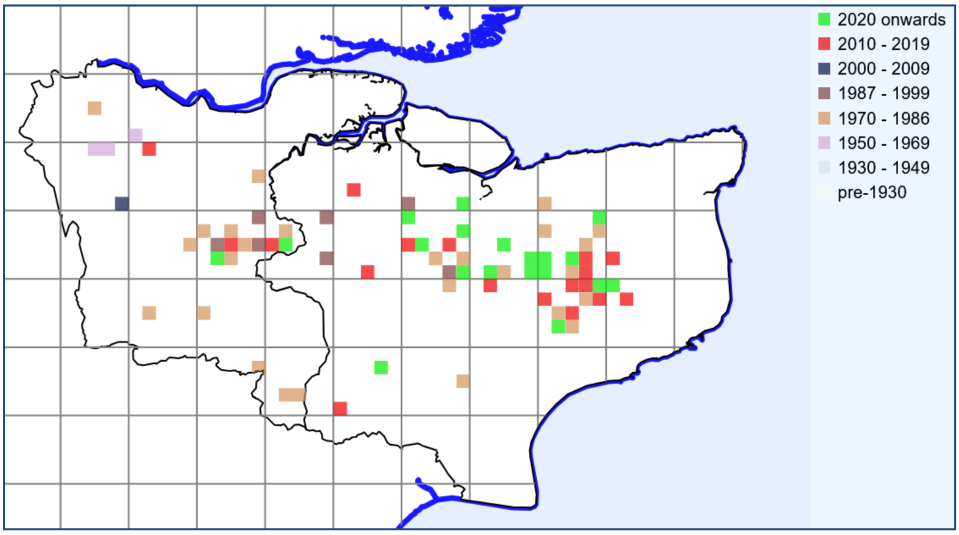
Atchester Wood.

Photos by Sue Buckingham, 1 July 2011

In the course of the 1971-80 survey published as Philp (1982), 52 tetrad records were made across the county; but Philp (2010) gives only 24 for 1991-2005. The Philp (2010) distribution shows retrenchment from the earlier survey to a core line across the county, apparently following the Folkestone and Hythe Formations and (ostensibly) the Chalk. There the species is shown in reduced numbers, and with 1971-80 outliers in the Weald and the north west of the county absent. The appearance on the Chalk is deceptive: these occurrences are on superficial deposits of an acid character.

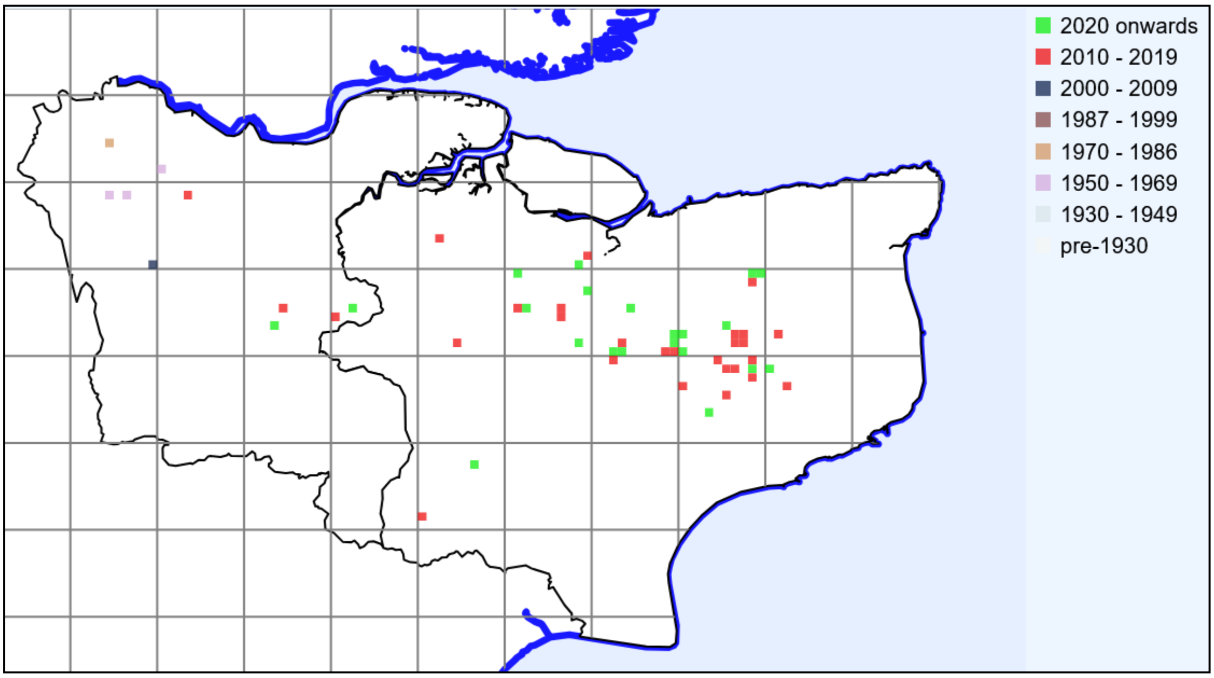
The records made for 2010-24 (37 tetrads, 49 monads) have exceeded the level of the 1991-2005 survey but are still only at 71% of the number recorded in 1971-80, so there has been a substantial decline which may have levelled off. Losses seem proportionately higher in West Kent.

Omalotheca sylvatica **Kent records to 2024 mapped at tetrad level, from BSBI database.**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Viewing distribution at tetrad level emphasises the historic position from 1970, when tetrad recording became the norm in Kent. Viewed at monad level, the 1970-2010 records tend to drop out, as monad recording only became the norm from 2010. The distribution at monad resolution, mapped below, shows distinct clusterimng in some areas, which would not be so apparent at tetrad level. This probably reflects the local presence of fairly extensive woodland on appropriate geology.

Omalotheca sylvatica **Kent records to 2024 mapped at monad level, from BSBI database.**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

The reason for decline is unclear. *Omalotheca sylvatica* is a short-lived perennial requiring open ground for establishment. Accordingly its woodland appearances are most likely to be along rides where there is disturbance and open marginal ground (the surfacing of rides will be counterproductive), and in areas recently cleared of trees or coppiced. A reduction in coppicing or a lengthening of coppicing intervals is likely to affect occurrence, so that it is possible for the species to appear to come and go as a function of habitat suitability. It is possible that this has had some impact on Kent records, as historically the county has had significant amounts of coppice – 44,000 acres in 1991 according to Roberts (1999)[468], who points out the volume of potential output in the 1990s well exceeded demand, which does not encourage coppice maintenance (although an increasing interest since then in wood as fuel may have provided some counter to this, at least until particulate pollution became an issue). However, since a decline has taken place nationally, including areas where coppicing has not been as significant as in Kent and other parts of south east England, it is likely that other factors are operating as well as any decrease in coppicing.

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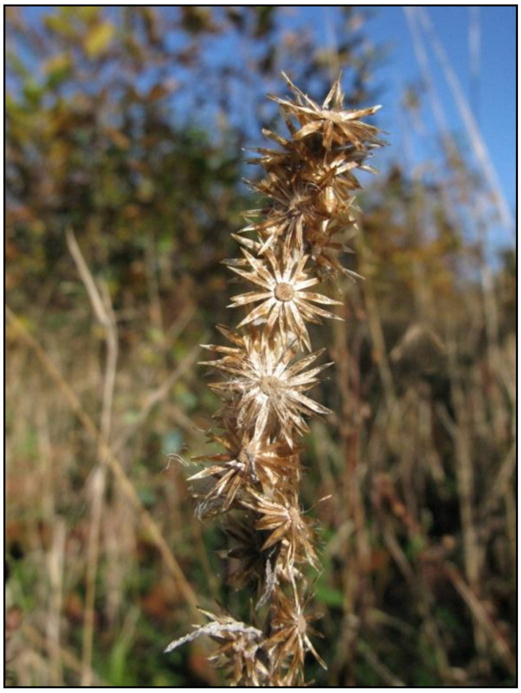
[468] G. Roberts (1999). *Woodlands of Kent*.

Records from 2010 onwards reinforce the relationship between this species and wood clearance. It was seen in 2010 at Covert Wood (TR1847 and TR1848) along many of the rides where a wide band along the edges been cleared and disturbed, and in 2011 at Witchling Wood (TQ9155), where a ride had recently been cleared and associated species of acid ground were also present, such as *Agrostis capillaris* (Common Bent) and *Galium saxatile* (Heath Bedstraw). Heath Cudweed was also found in a recently cleared area of Atchester Wood (TR1648) in 2010; in recently cut chestnut coppice in King's Wood (TR0249) in 2013; and on a sandy track at Gorsley Wood (TR1751 and TR1752) in 2013 where chestnut had been coppiced two winters before, so opening up light levels.

Probably the most frequent recorded habitat is open ground in or by chestnut coppice. Its relative infrequency in the High Weald coincides with a lack of chestnut-growing there.

Omalotheca sylvatica is readily distinguished from other cudweeds by its generally tall (up to 60cm) erect unbranched flowering spike, with stem leaves diminishing in size up the stem. It is recordable in winter months by virtue of its distinctive dried fruiting spikes (illustrated here).



King's Wood. Photo by Sue Buckingham, 10 November 2013

Onobrychis viciifolia Scop. (Sainfoin)

vc 15 and 16

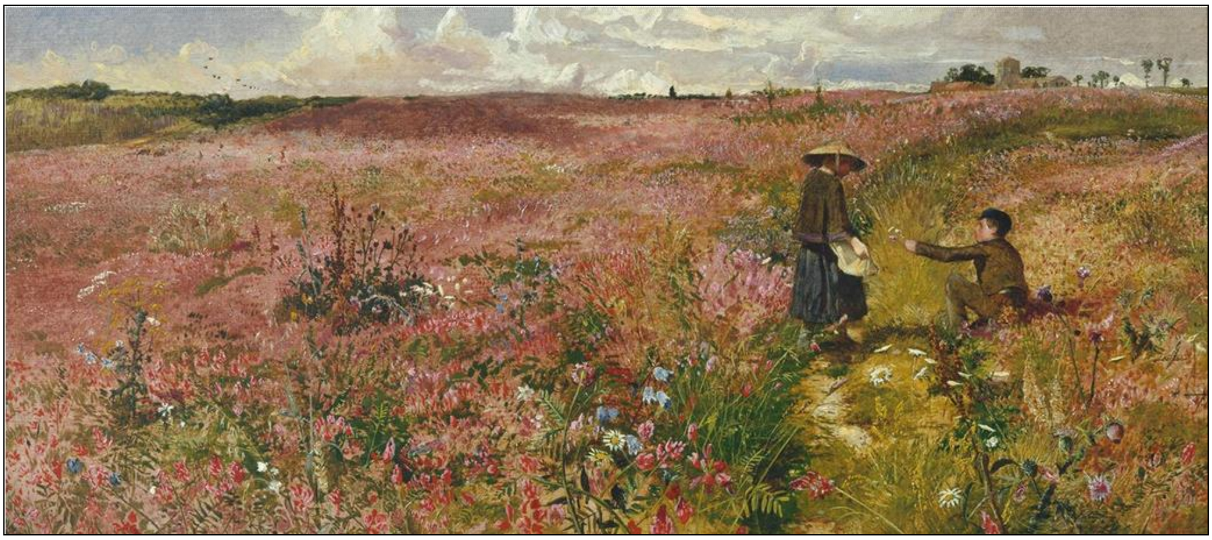
Rarity / scarcity status

Sainfoin is locally frequent in Britain as far north as central Scotland. It is regarded **Vulnerable** to the risk of extinction in Great Britain as a whole and in England, where its area of occupancy is taken to have declined by 35%, and its extent of occurrence by 31%, in comparing records for the periods 1930-69 and 1987-99. In Kent, the number of tetrads in which it was recorded fell by 46% between 1971-80 and 1991-2005. It is neither rare nor scarce in the county, but its appearance on the register is justified by the wider pattern of decline.

Queendown. Photo by Lliam Rooney, 18 June 2010

Account

The first published Kent record[469] of Sainfoin was by Thomas Johnson in his *Iter Plantarum* (1629), made in the course of travelling between Gravesend and Rochester. This was presumably the native form: the sowing of Sainfoin as a crop began in England on a tentative basis in the 1620s and 1630s, more fully on the Kentish downlands in the late seventeenth century[470] It was used as a nitrogen-fixer as part of crop rotation, and also to provide a fodder crop for mowing. Evidence of early use appears in farmers' probate inventories, e.g. Thomas Young of Hartley died 1688, possessing 20 bushels of sainfoin seed and 'clover and sainfoin on the ground which is to be mowed'. Usage continued through the 18th and 19th centuries: William Boys' *General View of the Agriculture of the County of Kent* (1796) mentions sainfoin as being much grown on the chalk-land of the eastern part of the county, mown for hay and capable of lasting for ten or twelve years, although sometimes grown on the down-land for five to ten years as part of a rotation of oats, fallow, oats, sainfoin (the latter generally started off sown in conjunction with a cereal crop). It is still (2017) grown as a fodder crop for horses in East Kent.



John Samuel Raven. Study (1857) for 'Saintfoin in Bloom', a view near Cobham in Kent.
Photographic Rights © Tate (2017). Available under a CC-BY-ND 3.0 licence, http://www.tate.org.uk/art/artworks/raven-study-for-saintfoin-in-bloom-view-near-cobham-in-kent-t03326

A consequence of this widespread cultivation has been to obscure the species' native status. Hanbury & Marshall (1899) said: 'On the chalk hills this handsome vetch has every appearance of being aboriginal; but it is so generally grown for fodder that, unless this cultivation could be shown to date from comparatively recent times, some slight doubt about its genuine wildness must remain'. Off the chalk (on sand or clay), they regarded the species as introduced or a relic of cultivation. Francis Rose collected it widely from chalk grassland and regarded it as a native, colonist or planted; but it is unclear how far he was able to differentiate, one problem being that the very habitat in which Sainfoin is most likely to be native, the poorest of chalk soils, is a habitat in which it was likely to be employed in cultivation.

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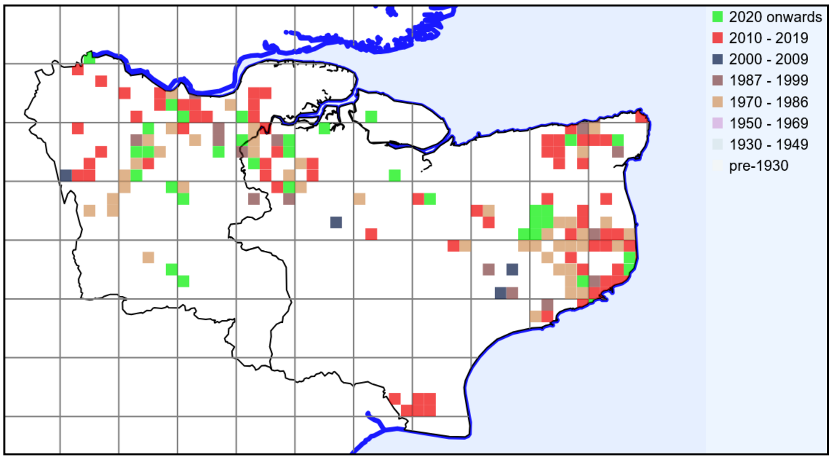
[469] Setting aside any archaeological appearance, e.g. a few seeds are said to have been found in 15th century contexts in Barber, L. & Priestley-Bell, G. (2008). *Mediaeval Adaptation, Settlement and Economy of a Coastal Wetland: the evidence from around Lydd, Romney Marsh, Kent*. Oxbow Books.

[470] Thirsk, J. (1997). *Alternative Agriculture A History*. OUP Oxford.

Habitat, presumed native; South Foreland, Dover.
Photo by David Steere, 7 May 2016

Philp (1982) recognised the native/introduced dichotomy, and gave the species as present in 85 tetrads, including where it had been naturalised on roadside verges as a chance or purposeful introduction with grass seed. An example of the latter situation is the M2 motorway on the chalk cutting immediately south of the Medway crossing, where *Onobrychis viciifolia* and other calcicolous species were sown in the hope of establishing vegetation appropriate to the area[471]. However, such sowings have been widespread for a number of purposes, for example the species has been a component of the pollen and nectar seed mix (WM2, AB1) recommended under successive Countryside Stewardship Schemes; it is part of wildflower seed mixes generally and has been used for amenity land and developments such as Bluewater shopping centre.

Philp (2010) found it present in only 46 tetrads and considered it in decline through loss of habitat, but as our 2010-24 records amount to 106 tetrads (129 monads), evidence of decline is lacking; on the contrary, there appears to have been an increase. Admittedly, the recent records include data from metropolitan West Kent which Eric Philp did not cover (eight tetrads); but new records will continue as long as introductions take place.



***Onobrychis viciifolia* Kent records to 2024 mapped at tetrad level, from BSBI database.**

It will be seen that the historic distribution has been fairly constant in avoiding the Weald, but that the individual sites for 1971-80 and 2010-22 surveys are not necessarily the same, although within the same general areas. The recent records for the Walland Marsh area near Dungeness do not correspond to earlier ones; Sainfoin has been widely sown here as part of a seed mix. *Plant Atlas 2020* (2023) treats Kent records on the chalk, especially in East Kent, as native. This is probably an over-simplification, but as a decision for working purposes is understandable.

There appear to be no Kent records for any of the subspecies, although there is clearly variation in the plant as found in the county. Stace (2019) indicates that recognition of separate subspecies is probably not feasible or helpful. However, Sell & Murrell's *Flora of Great Britain and Ireland* states that subspecies *collina* (slender stems, prostrate, leaflets 5-15 x 2-5mm) is the native plant on remnants of chalk grassland; subspecies *decumbens* (stems decumbent to ± erect, slender to robust, leaflets 10-35 x 4-8mm, corolla 10-12mm) is in wild flower seed mixes and likely to be spread on mowers; and subspecies *viciifolia* (stems ± erect, robust, leaflets 15-35 x 4-8mm, corolla 12-16mm) was formerly grown as a hay crop.

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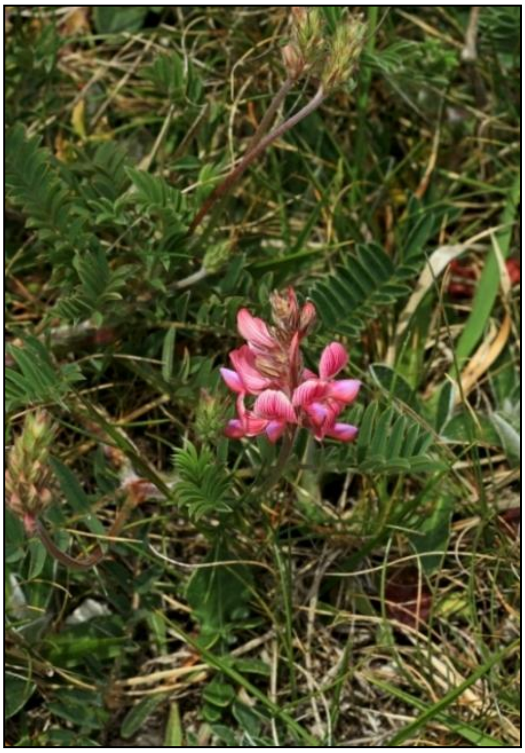
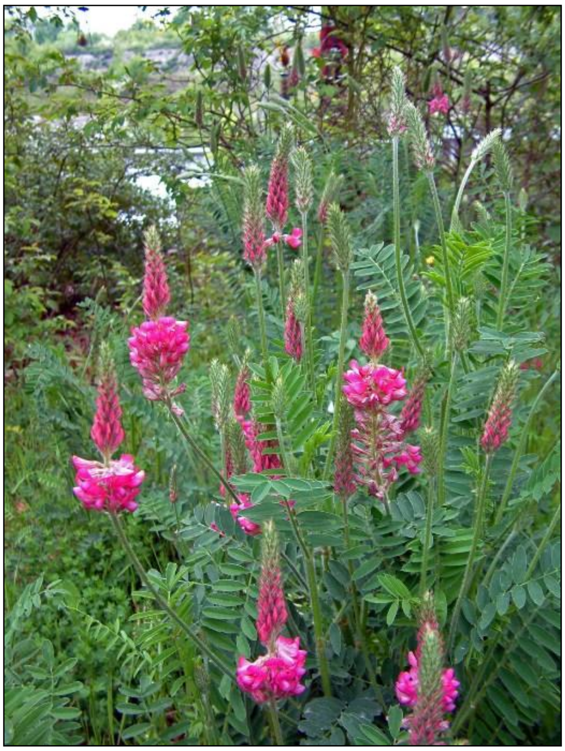
[471] Way, J.M. (1976). *Grassed and planted areas by motorways*. Institute of Terrestrial Ecology.

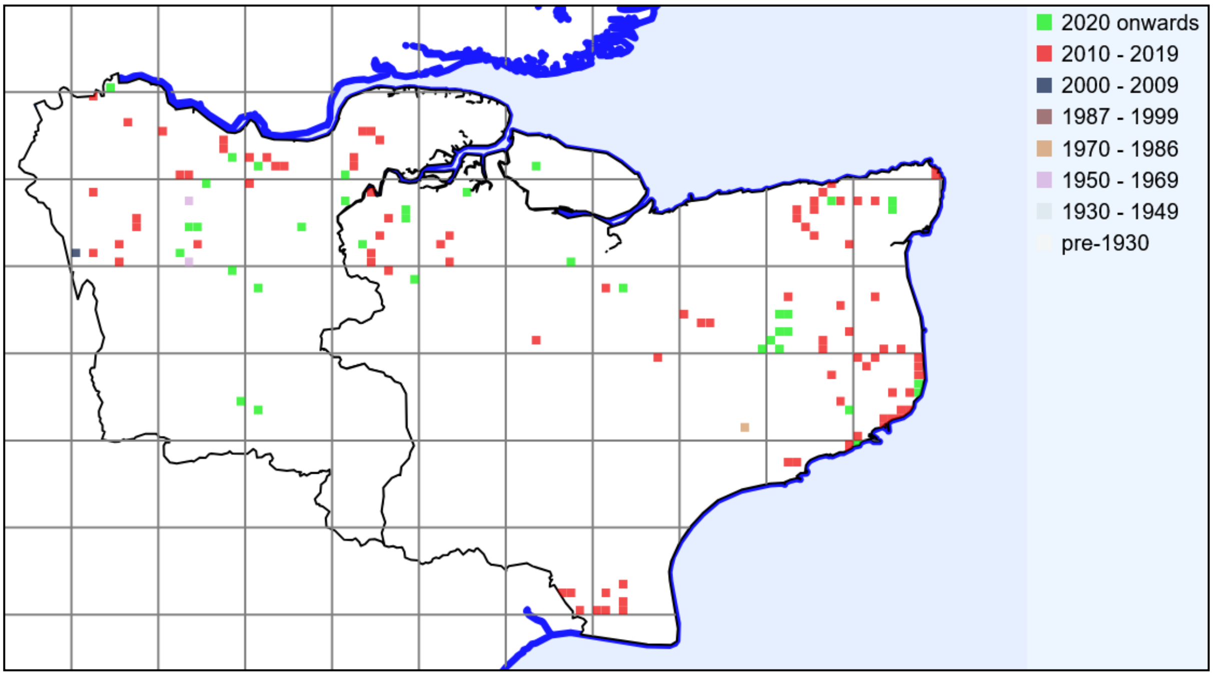


Bluewater, derived from amenity sowing.
Photo by David Steere, 25 April 2014.



Dover, White Cliffs; presumed native form.
Photo by David Steere, 7 May 2016.

Onobrychis viciifolia **Kent records to 2024 mapped at monad level, from BSBI database.**


🟩 2020 onwards
🟥 2010 - 2019
🟦 2000 - 2009
🟫 1987 - 1999
🟧 1970 - 1986
🟪 1950 - 1969
⬜ 1930 - 1949
⬜ pre-1930

Ononis spinosa L. (Spiny Restharrow)

vc 15 and 16

Rarity / scarcity status

Ononis spinosa is locally frequent in Great Britain north to south Scotland, particularly in south and central England, but excluding the south west. Whilst its conservation risk status in Great Britain as a whole has been one of 'Least Concern', a more recent assessment for England has identified the species as **Near Threatened**. This is because its area of occupancy in England is taken to have declined by 25% in comparing records for the periods 1930-69 and 1987-99. In Kent, there is evidence of a 49% decline in tetrad records between 1971-80 and 1991-2005, although the species is still neither rare nor scarce in the county. It is a Kent axiophyte and so is indicative of good habitat.

Sandwich. Photo by David Steere, 30 July 2016

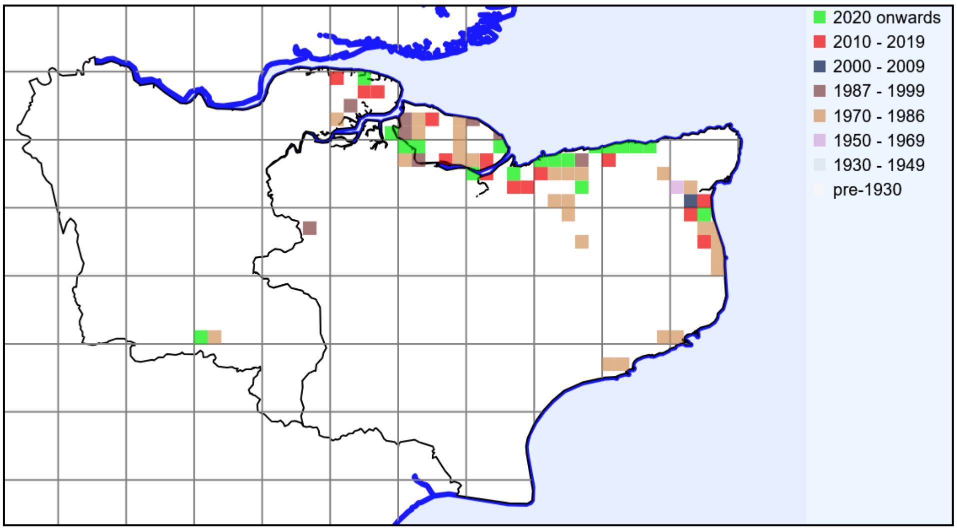
Account

Hanbury & Marshall (1899) give the first Kent record as by de L'Obel (*Stirpium Adversaria Nova*, 1570), who stated that it was present in some wet coastal meadows, especially at Bristol and near London. The honours for the latter locality, however, could belong to Kent or Essex. The next Kent records in point of time are by Thomas Johnson: a plain record for *Ononis* at Chatham (*Iter Plantarum*, 1629) is likely to be *Ononis repens* (Common Restharrow); but a find of *Anonis sive Ononis spinosa* (*Descriptio itineris*, 1632) made whilst travelling westwards from Ash towards Canterbury is clearly intended for Spiny Restharrow. Hanbury and Marshall also listed a range of other records, historic and (then) recent, summing up the species as a plant of roadsides and waste places, especially on stiff soils; not uncommon, but by no means as abundant as *O. repens*. Some records they felt were in doubt, as perhaps belonging to the latter species and this has been a perennial problem, because *O. repens* and *O. spinosa* do not always separate satisfactorily. There are some inland records which one might be inclined to dismiss, given that more recent records have been coastal, but that they include ones made on good authority, and there is a strong inland distribution in south central England on infertile calcareous grasslands, including on clay.

Photo by Lliam Rooney, 14 July 2010

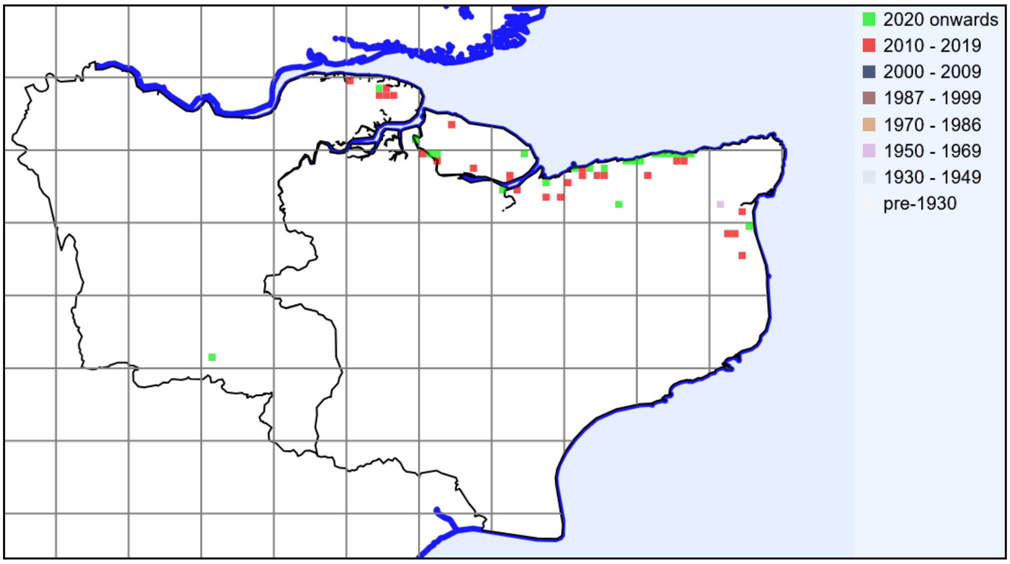
The clay association is evident with many of the finds by Francis Rose, such as in pasture on London Clay east of All Hallows (1954); a low bluff on London Clay at Harty Isle (1955); dry banks on alluvial clay behind the sea wall at Lower Stoke (1959); a roadside on clay near the sea at Pegwell Bay (1946); and on banks, clayey grassland west of West Stourmouth (1956).

Philp (1982) regarded Spiny Restharrow as rather local, on roadsides, sea-walls and waste places, with 83 tetrad records for the period 1971-81, mostly coastal, from the Hoo Peninsula to Folkestone. By the 1991-2005 survey (Philp, 2010) the number of tetrads had reduced to 27, and the coastal distribution no longer continued south of Sandwich / Deal. The reduction was in spite of the occasional plant being noted where a wildflower seed mix had been sown. Although the species has since been found as far south along the east coast as Dover, our 2010-23 records amount to 32 tetrads (48 monads); so this provides some endorsement for the existence of a decline before Philp (2010), but not since.



***Ononis spinosa* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Distribution shows a strong relationship with areas of London Clay along the Kent north coast. The anomalous 2020 Wealden record is alongside car park access at Pembury hospital, and taken to have arrived with seed mix when the hospital was built, 2008-11. Its neighbouring historic record is doubtful. It is intriguing: there is suitable territory at Sheppey which seems to have carried much in the past, but it is more surprising that so many east coast records should not have been re-found, these being well-botanised areas. The east coast locations have, however, since produced *O. repens* records, which raises the question of whether *O. spinosa* was accurately recorded. (Eric Philp was a complier of the 1970-81 results, by no means the sole recorder, and was not wholly satisfied with the outcome for some species.) Mapping at monad resolution below shows finer detail, but mostly comprises recent records, as monad recording did not become the norm in Kent until 2010.



***Ononis spinosa* Kent records to 2024 mapped at monad level, from BSBI database.**

Mainstream botany treats *O. spinosa* and *O. repens* as separate species, as we have done here, on the following basis:

- *O. repens*: usually procumbent (to ascending); stems rooting above the base, more or less hairy all round (but perhaps sparsely so); pod shorter than calyx, 1-2 seeded.
- *O*. spinosa: usually erect or ascending; stems not rooting above base, mainly hairy along one side or two opposite sides; pod exceeding calyx, 2-4 seeded.

The presence or absence of spines is not diagnostic: *O. repens* is often spiny (var. *horrida*) and *O. spinosa* may lack them (var. *mitis*). Sell and Murrell in the *Flora of Great Britain and Ireland*, however, place them under one species, *O. spinosa*, with four subspecies. These are: subsp. *spinosa* (equivalent to *O. spinosa*, and a plant of clay soils); subsp. intermedia (equivalent to *O. spinosa x repens*, a fertile hybrid); subsp. *procurrens* (equivalent to *O. repens*, and a plant of dry calcareous grassland); and subsp. *maritima* (equivalent to *O. repens* subsp. *maritima*). This last taxon is one of shingle beaches and cliff tops and sounds much like a 'peculiar shaggy plant, found in some plenty by Marshall in 1894 on the beach W. of Sandgate' mentioned in Hanbury & Marshall (1899).

Sandwich. Photo by David Steere, 30 July 2016

Ophrys fuciflora (Crantz) Moench (Late Spider-orchid)

vc 15; records for vc 16 are assumed to be in error

Rarity / scarcity status

Ophrys fuciflora is one of Britain's rarest orchids and is restricted to a few localities in East Kent; records from elsewhere appear to be misidentifications. It is considered to be **Vulnerable** to the risk of extinction in England and Great Britain as a whole, in view of the small number of adult plants. The total was assessed by Francis Rose at c. 100 in 1981 (although there have been occasions in the 1940s and 1950s where single locations held 100 plants), and more recently given as c.360 in the *Vascular Plant Red List* [472], and experts consider the 2017 position to be 550-600 plants (Phil Green) or 485-795 (Alfred Gay). The number of plants, because of those vegetative or dormant, is of course not necessarily the same as the number of flowering plants, which varies from year to year and averages around 200 (counts by Alfred Gay are 196 for 2021; 309 for 2016; 338 for 2014; 170 for 2013; and 347 for 2022). The orchid is protected from picking or uprooting, under Schedule 8 of the Wildlife and Countryside Act 1981 as amended, but notwithstanding this, damage has occurred. Accordingly, detailed grid references have been redacted from the information provided in this account. It is a **nationally rare** species, but in Kent it is **scarce**.

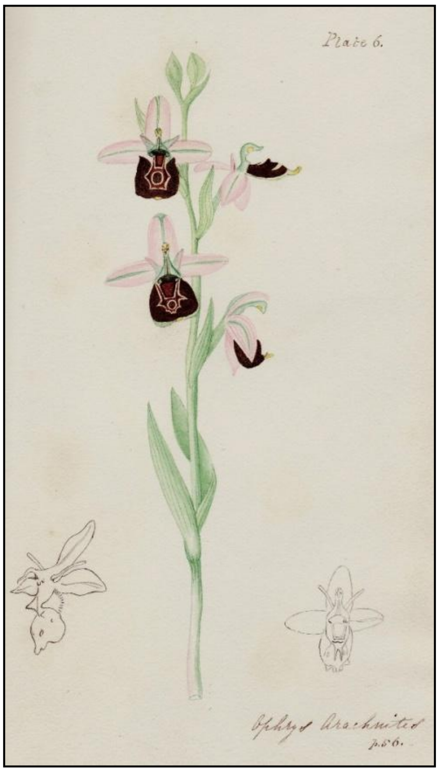
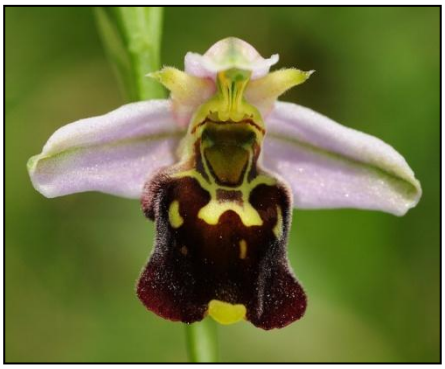


Plate 6.
Ophrys arachnites
p.56.

G.E. Smith's own illustration of *O. fuciflora*, from his personal copy of the 1829 *Catalogue*

Account

The Late Spider-orchid was first published as present in Kent – and Britain – as a late addition to the second edition of Sir James Smith's *English Flora* (1828), as a result of its recent discovery by G.E. Smith (no relation), who found it to be 'Plentiful on the southern acclivities of the chalky downs near Folkestone, Kent. The conical hill which forms the north-west boundary of the Cherry-Garden, near that town, abounding in its upper half with this species...'. G.E. Smith had recognised it as a distinct species, although then unaware that it had been described on the Continent (as *Ophrys arachnites*). This publication was quickly followed by G.E. Smith's own, *A Catalogue of rare or remarkable Phaenogamous Plants, collected in South Kent* (1829), in which he mentioned that Mr Andrew Matthews (who must be credited as the first discoverer) had collected specimens 'several years since' at Ospringe, and that Smith's own encounter with the species was also the first time that he had seen *Ophrys. apifera,* (Bee Orchid) which was growing nearby. He also speculated as regards a hybrid between *Ophrys fuciflora* and *O. sphegodes* (Early Spider-orchid) being the identity of a plant collected by Mr Lee on downs between Newington and Lyminge: simultaneous flowering of Late and Early Spider-orchids was observed by Smith on 17 May 1828.



Wye. Photo by Lliam Rooney, 15 June 2010

Hanbury & Marshall (1899) considered the species to be very rare and local on downs, rough banks, etc. on the chalk, with most records along the downs eastwards from Wye to Folkestone. Over the years there have been over 20 recorded populations, of which Francis Rose, writing of the period from the 1940s to the 1960s, considered that it was then confined to about 16 localities; but currently it may be considered as having 11 populations. Losses have been attributed to agricultural 'improvement' and reduced grazing (whether by livestock or, post-myxomatosis, rabbits) since c.1960. Reduction of grazing is significant, because the orchid tends to grow on slopes where *Brachypodium pinnatum* agg. (Tor-grass) is present, and if this is unchecked, the grass becomes tussocky and dominant, whereas the orchid needs a fairly open habitat with moderate disturbance, even though it is capable of growing in swards up to 15cm high. Philp (1982) gave nine tetrad records; Philp (2010) gave ten. Overall, its population status now seems fairly stable, although there are fluctuations at individual sites. Most are on steep downland slopes, often as much as 1 in 1.5, and plants favour the terracettes along the contours, formed by solifluxion and the passage of grazing stock, which tend to provide some bare ground. All are now on SSSIs or Local Wildlife Sites.

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[472] Stroh, P.A. et al. (2014). *A Vascular Plant Red List for England*. Botanical Society of Britain and Ireland. Bristol.

Wye

Ophrys fuciflora was first recorded on Wye Downs in 1889. The populations at Wye have been much studied. The Wye NNR warden, J. Duffield, undertook detailed recording in the period 1965-78 at the Devil's Kneading Trough and New Barn Coombe (otherwise Bulltown). These observations ('the 60s/70s Wye studies') are further mentioned below. Wider recording was subsequently undertaken by D.A. Stone and R.V. Russell[473] (see later in this account, 'the 80s/90s Wye studies') and covered what they recognised as six colonies, carrying 50% of the UK plants. They included sites at the Devil's Kneading Trough; Fishponds Down; Aldglose Down; and New Barn Coombe (Bulltown, two colonies). Overall, after there had been a growing set of colonies during the period 1987-98, this growth does not appear to have continued exponentially. In 2014, however, 58 flower spikes were seen at Aldglose Down (nine in 2016), some showing signs of hybridisation with *O. apifera*; also 21 at the site above Fishponds Farm (seven in 2016) and ten at the Kneading Trough (none in 2016; this seems to have been only a small colony for a long time, between 1965 and 1978 carrying between zero and six inflorescences). Also, in 2016 there were 31 flower spikes at Bulltown. In 2021, there were ten at the Devil's Kneading Trough; 38 at Fishponds Down; 51 at Aldglose Down; and 47 at Bulltown.

Wye (Bulltown), habitat. Photo by David Steere, 28 May 2016

Postling Downs

Presence on the downland dates at least back to 1853 and is plentifully represented by herbarium specimens since. The site was spray-fertilised in the 1970s and the species was supposed to have disappeared around that time. A single plant appeared in June 2005 around where Francis Rose knew it in the 1940s and 1950s, but was not seen to recur. The same month, Peter Gay found a colony on the south side of a small valley, counted at 79 spikes in 2010 (102 in 2016). A further colony of 49 spikes less than 100m away on the north side of the coombe valley was found by Alfred Gay in June 2009, 76 spikes in 2010 (84 in 2016). In 2014 the total number of inflorescences, in three locations, was 121; many were grazed off by cattle during the flowering season. *O. apifera* grows here as well, and four hybrid spikes were seen in 2010. The presence of *O. apifera* renders it difficult to count non-flowering plants of *O. fuciflora*; there may be some 200 plants, as distinct from spikes. In 2021, a count was made of 34 flowering spikes, virtually all on the north side.

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[473] Stone, D.A. & Russell, R.V. (2000). Population biology of late spider orchid *Ophrys fuciflora* – A study at Wye National Nature Reserve 1987-1998. *English Nature Report 389*. Peterborough.

Postling Downs, habitat. Photo by Alfred Gay, 7 June 2011

Parkgate Down (KWT reserve)

This is a dry valley of the Downs dip slope, 4½ miles from the escarpment which is the usual habitat of the Late Spider-orchid. Records go back at least to 1926, but it has been a small colony, occurring intermittently (perhaps at best 20 spikes in 1958, but two spikes in 2010, none in 2016), and the few recent plants are considered by Richard Bateman to be hybrids with *O. apifera*. It is possible (Phil Green, pers. comm.) that the soil here is a little too acid for the orchid: a period of good growth followed burning which would have left an alkaline ash residue, after which the colony's vigour fell back again. The site also lacks a full southern aspect for the orchids, however, which may be influential.

Great Shuttlesfield Down

A small colony, known at least back to 1938 (when material was collected by Francis Rose), grows on MOD land, a south-facing chalk grassland slope, with flowering spikes generally in single figures each year (four in 2014; but none in 2016), although more numerous in the past, when up to 20 inflorescences were recorded in most years; 20 is now probably the number of plants present, as distinct from spikes. *O. fuciflora x apifera* has been recorded here and a specimen taken for DNA analysis was interpreted as showing signs of introgression with *O. apifera*.[474]

Shuttlesfield, habitat. Photo by Alfred Gay, 5 July 2013

Arpinge

This site is on a gentle downland slope, south west facing, which is part of a MOD training area. Late Spider-orchid has been known here at least back to 1958. From 1987 to 2006, it produced around 25 to 50 spikes per annum, with a maximum of 56 spikes in 1999. After 2006, the rabbit population increased greatly with the result that very few flowering spikes could be found (e.g. four in 2010; ten in 2014; none in 2016). *O. sphegodes* grows with *O. fuciflora*, and this may well be the locality where Mr Lee's putative hybrid was found; the cross was found here by L. Margetts in 1958. *O. apifera* is also present, sometimes in abundance. Two plants with yellow-green lips were reported in 2023.

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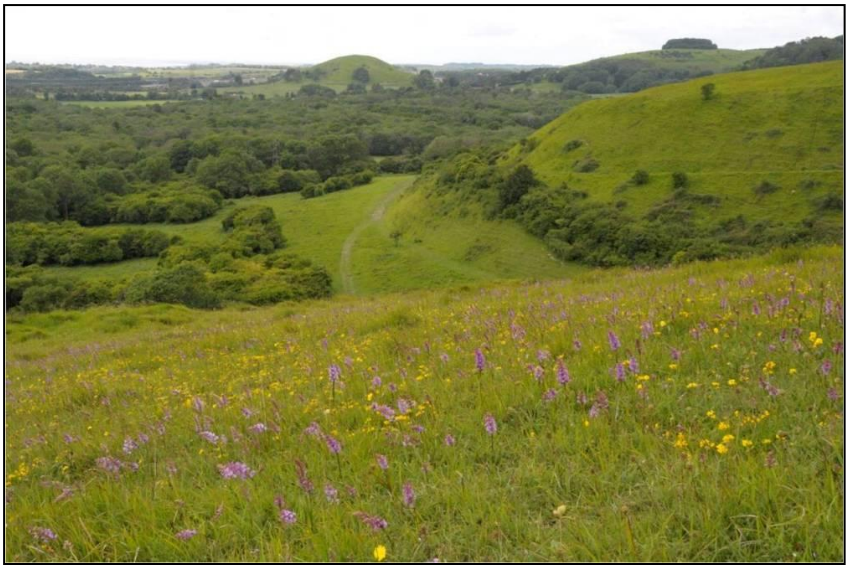
[474] Devey, D.S., Bateman, R.M., Fay, M.F. & Hawkins, J.A. (2009). Genetic structure and systemic relationships within the *Ophrys fuciflora* aggregate (Orchidaceae: Orchidinae): high diversity in Kent and a wind-induced discontinuity bisecting the Adriatic. *Annals of Botany* **104**: 483-495.



Arpinge, habitat. Photo by Alfred Gay, 23 June 2013

Folkestone Downs

The chalk downs above Folkestone, especially from Cheriton Hill eastwards (with the original site at Cherry Garden) via Castle Hill to Holywell and Sugarloaf Hill were the subject of collections from the 19th century onwards.

Folkestone Downs, habitat. Photo by Alfred Gay, 25 November 2016

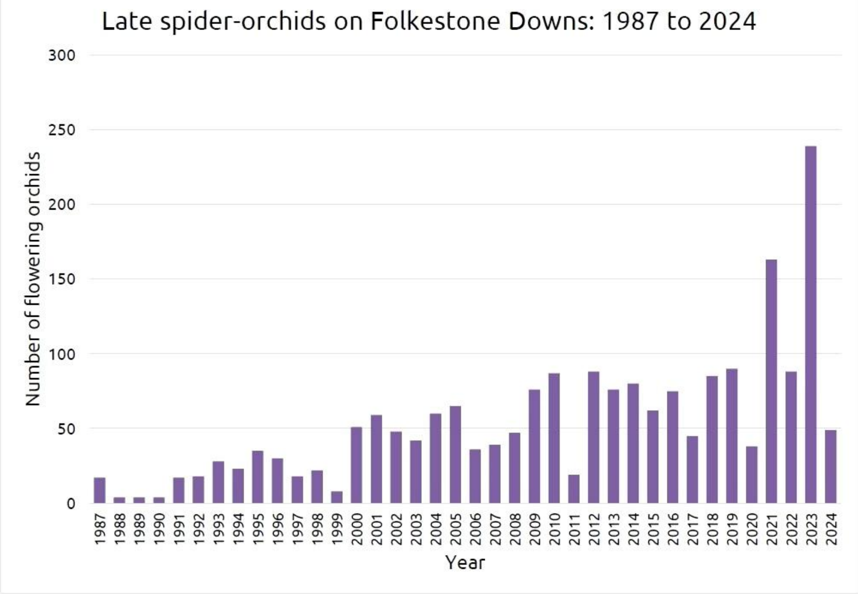
A colony at Cheriton Hill was known to Francis Rose from 1939 to 1945 (when there were 27 plants), but was later ploughed up. Either plants or seeds are presumed to have survived in the uncultivated grassy edge and when one plant was found in 1999 and a second at the other end of the bank in the following year, the site was monitored and plants were cross-pollinated. The colony revived to become the strongest and largest Folkestone population, with 217 rosettes present at Cheriton Hill in 2016 (201 plants in 2013; 221 in 2010). Its main focus is towards the top of the hill, where there were 134 plants in 2016, especially along the south-facing downland bank alongside the North Downs Way on the east side of Cheriton Hill. By 2014 there had been summer cattle-grazing for 10-15 years which appears to have encouraged colony growth. Flower spikes here tend to be taller than with other populations; carrying 6-11 flowers is normal (whereas most flower spikes elsewhere are around 8-12cm tall with an average of about four flowers). This may be a consequence of proximity to the road, with a more nutrient-rich and moist soil. The site is perhaps the most accessible one for the species. Further down Cheriton Hill, at a site west of Cherry Garden, is another focus of distribution.

To the east, Castle Hill was, at least in the 1970s and 1980s, regarded as perhaps the best Kentish site with up to 100 plants 1953-62 on a steeply terraced south south-east facing slope which curves round towards Round Hill ('the Horseshoe); but the site scrubbed up and is now mature ash woodland. Holywell itself is a damp area, the orchid having been recorded on adjacent dry, steep downland (24 plants in 1974; 12 inflorescences in

2014; 31 plants producing only two inflorescences in 2016). Nearby Round Hill (south east facing slope) has also had records, and Sugarloaf Hill held the orchid in three sloping areas (facing west, south and south south-east) but from 40 plants in 1970 the colony deteriorated to a last record in 1976.

Folkestone Downs. Photo by Lliam Rooney, July 2013

The Folkestone populations overall show an encouraging trend of increase since 1987, at least to 2023. This is illustrated by the table below, taken from the Folkestone Downs Management Plan 2025 to 2030, produced by White Cliffs Countryside Partnership. The number of flowering plants is only a limited measure of the health of the set of populations, measured by the total number of plants, including those not flowering. It may be that no more than a third or half of the population will flower each year. Also, what may appear to be a poor year from the perspective of visible flower spikes may have very little bearing on how the populations are developing.



Change in the number of late spider-orchids flowering on Folkestone Downs from 1987 to 2024.

Year	# orchids	Year	# orchids
1987	17	**2006**	36
1988	4	**2007**	39
1989	4	**2008**	47
1990	4	**2009**	76
1991	17	**2010**	87
1992	18	**2011**	19
1993	28	**2012**	88
1994	23	**2013**	76
1995	35	**2014**	80
1996	30	**2015**	62
1997	18	**2016**	75
1998	22	**2017**	45
1999	8	**2018**	85
2000	51	**2019**	90
2001	59	**2020**	38
2002	48	**2021**	163
2003	42	**2022**	88
2004	60	**2023**	239
2005	65	**2024**	49

The colonies of late spider-orchid on Cherry Garden Hill and the Holywell Slope are long established and have been monitored every year since 1987. Since 2000, a strong population has also established at the top of Cheriton Hill with smaller satellite colonies at two other locations at the top of Cheriton Hill. Historically, the late spider-orchid also occurred on Sugarloaf Hill and Castle Hill.

There is much variation in the appearance of the flowers of Kent Late Spider-orchid, most markedly in the lip colour, shape and patterning. Philp (1982) mentioned that in recent years some plants had been noted with affinities to Continental *Ophrys scolopax* (Francis Rose recorded '*scolopax* type' at Shuttlesfield and Park Gate in 1987) and that either this species, or presumably a genetic contribution from it, might need to be recognised, or *Ophrys fuciflora* was more variable than generally realised. The answer looks to be one of variability, and it is notable that the degree of genetic variability (not necessarily to be fully equated with morphological variability, however) of Kent populations is higher than might have been supposed. Material from the Arpinge, Bulltown, Channel Tunnel (presumably Folkestone Downs) and Holywell populations has been subjected to AFLP genetic fingerprinting[475], and it was found that their genetic variability was greater than that of the rest of the central European populations (extending to Austria in the east and to Sicily in the south). This may represent more than one Kent post-glacial re-colonisation event by members of different genetic lineages. It is primarily a Mediterranean species, with the warm, south-facing chalk escarpment of the Kent downs being at the fringe of its distribution, rare (if still present) in the Pas de Calais but fairly plentiful in the Somme valley, where the chalk again faces south.

‘Abnormal’ variation in *Ophrys fuciflora* flowers

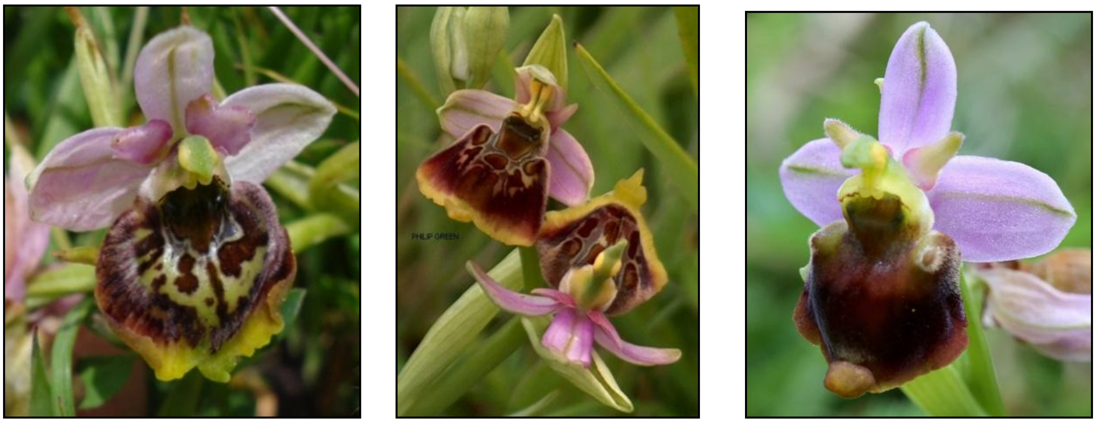


Photo by Phil Green

Photo by Phil Green

Wye. Photo by Ian Hadingham

Genetic analysis also indicates a degree of both distinctiveness and similarity between the sampled Kent populations, such as to suggest some, albeit restricted, gene flow between them. Setting aside any deliberate hand pollination between different populations (which has, occurred, e.g. between the Wye (Bulltown) and Shuttlefield populations), genetic transmission will be either by pollen or seed. *Ophrys fuciflora* appears to lack a specific pollinator in Britain; the bee species observed effecting pollination on the Continent are generally not present with us, except for *Eucera longicornis*, which is very scarce. However, whether by pollen beetles or otherwise, cross-pollination presumably must be effected, or hybrids would not have been formed. Developed seed capsules are uncommon, but even one capsule will provide very large numbers of small seeds for wind distribution, so wider spread is possible. The 60s/70s Wye studies found that seed-set without intervention was an unusual event – 3.9% of florets produced naturally set seed capsules (30 from a total of 806 florets in the study period, deducting 34 florets out of that total which were hand-pollinated). Although *Ophrys fuciflora* clearly does not have the facility of self-fertilisation possessed by *Ophrys apifera*, nevertheless, seed capsules may, at least sometimes, instead be the product of selfing: Alfred Gay (pers. comm.) has found plants with dislodged pollinia, apparently the result of accident, and sometimes a swollen seed pod was found later, usually only one flower being affected, which does not suggest a consistent self-pollination strategy[476]. Phil Green (pers. comm.) believes that when only a few flowering spikes are present, there is normally no pollination, unless through disturbance. But when a good number are close by, then ‘casual’ insect visits occur, by which natural cross-pollination takes place. Few seed pods are produced even so, but these should be enough to sustain a healthy population of this relatively long-lived species. However, conversely, if the number of plants producing flowering spikes together drops, then the insect attraction of the group presumably diminishes so as to reinforce colony decline. An occasional cause of pollination appears to be deliberate acts by persons other than managers of the relevant site; this may be detectable by the amount of pollen appearing to have been transferred.

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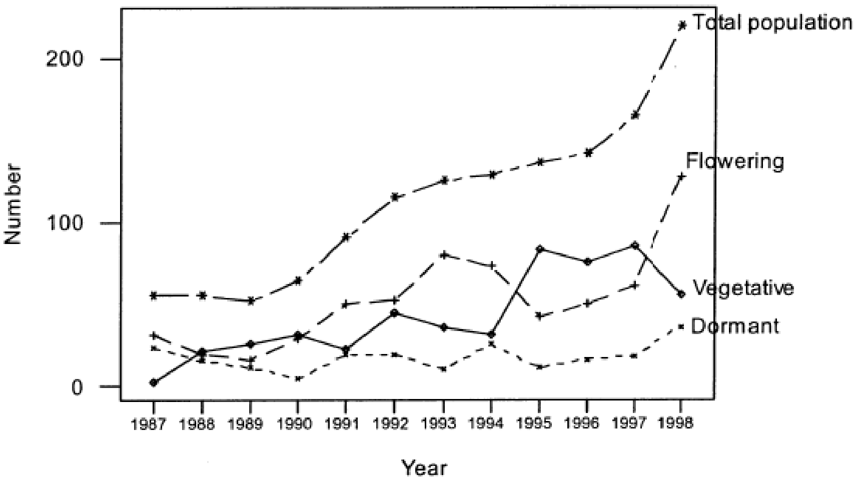
[475] Devey, D.S. et al. (2009), *vide supra*.

[476] This is notwithstanding that self-pollination is said not to occur (which is evidently the case in normal circumstances) in Stone, D.S. & Taylor, P.A. (1999). *Ophyrys fuciflora* (Crantz) Moench & Reichenb. (Orchidaceae). In (ed.) Wiggington, M.J., *British Red Data Books 1 Vascular Plants (3rd edition)*. JNCC.

The 80s/90s Wye studies suggested that (based on over 8,000 measurement of distance between recorded plants at Wye) vegetative reproduction in the UK does not readily take place and is not part of the species' survival strategy. Alfred Gay, however, considers that vegetative reproduction may not be uncommon in relation to the Folkestone plants. Such reproduction may (as with self-fertilisation) tend to preserve, to a limited degree, local variation in flower characteristics. Phil Green has seen the annual production of new tubers sometimes result in a clonal group, rather than simple replacement of the plant. Generally there are groups of two or three identical plants, but up to five have been recorded. This appears to be the only way in which this very variable species produces plants with fully identical flowers. But it is not vegetative reproduction in the sense of a widening clonal clump; rather it may extend the life of the original genetic entity, without spreading further than the small clump which often dies back to one plant and may eventually die out altogether.

Wye. Photo by Lliam Rooney, 13 June 2012

The 80s/90s Wye studies drew a number of conclusions from the populations monitored. *Ophrys fuciflora* in Kent has a preference for disturbed, free-draining soil of low fertility, which is afforded by the thin rendzina soils over chalk on the steep slopes of the downs escarpment; these slopes should face so as to provide warm winter soils. Ground disturbance may be particularly relevant to establishment, with the potential for more mature grassland to develop around a plant during its lifetime. There is some evidence from Wye for the value of disturbance (Alfred Gay, pers. comm.), with one colony being on an old spoil heap, another very close to a rabbit warren and a third including the site of a tumulus which had been ploughed out in 1958, but which has been re-colonised. At Wye, the 80s/90s studies describe it as growing in two communities: *Brachypodium pinnatum* agg. grassland (CG4) and *Festuca-Avenula* grassland (CG2), with intermediates. Plants existed in a vegetative, flowering or (underground) dormant state and moved between them. The dormant state did not last more than two years at a time, assuming that the plant had already gone through an above-ground stage. The proportions of plants in different states vary considerably, as shown by the accompanying table (© English Nature, 2000), which makes it clear that firm conclusions about population trends cannot always be reached by counting flower spikes alone (as may also be seen from the Folkestone Downs data above) – or it



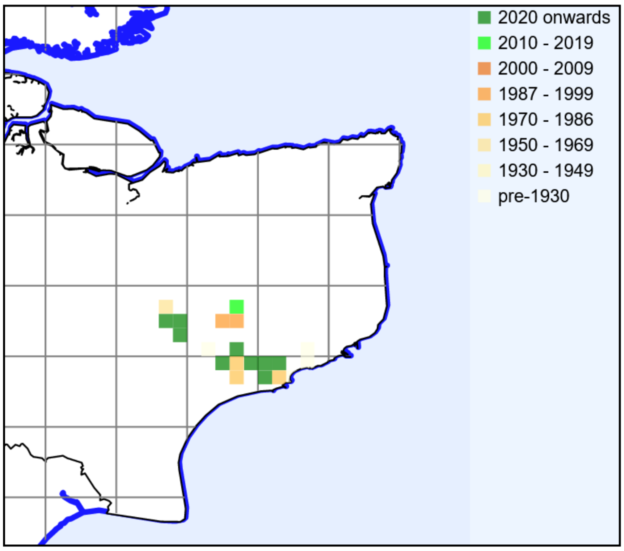
would be supposed that the period 1992-94 was one of decline, whereas it was one of net gain.

It will also be seen that there was a growth in total population over the period of study (this is against a background of low mortality). This seems to have been encouraged around 1991-92 by winter grazing and some strimming of rank vegetation.

The species is also fairly long-lived. The mean half-life of *Ophrys fuciflora* (the time taken for a population to fall by 50%, assuming that environmental conditions remain constant and favourable) was calculated at 12.5 years, starting from adult plants. Survivorship of the 1998 population cohort was calculated at 60 years (i.e. without recruitment it would take that time for a population to be reduced to one individual). The 60s/70s Wye studies found four plants which lived throughout the 14 year duration of the survey period. As regards Folkestone populations, Phil Green considers that, against a background of plants being able to live for 25 years, the orchid's normal flowering life is 10 to 15 years, although it is frequent for plants not to flower every year and, indeed, they might cease producing even leaves for two or three years. It was possible to confirm that it was the same plant reappearing after that cessation because he undertook fixed point recording (until 2014) and photographed each flowering plant (each individual is sufficiently different that it can be identified on reappearance).

The 80s/90s Wye studies also found *Ophrys fuciflora*, far from being sensitive, exhibited the characteristics of a stress-tolerant species, one which is opportunistic but easily out-competed for resources and so adapted for environmental conditions where competition is reduced. Ideal management according to the 80s/90s Wye studies should maintain nutrient removal, achieve a uniform sward and provide 5-10% bare ground, with grazing timing that avoids cropping flowering or seeding spikes. There is room for more than one view as regards the timing of grazing. Phil Green (pers. comm.) points to the effectiveness of low levels of mostly summer grazing by cattle over 15 years as having increased the colony at the top of the east Cheriton Hill slopes from none to c. 100 plants, even though this coincides with flowering/fruiting. *Brachypodium pinnatum* agg. (Tor-grass) growing on the Folkestone Downs, has potential to crowd out the orchid. Winter grazing only reduces the height of the grass, which is then left unchecked to grow, flower and set seed in summer; whereas summer grazing will stress this and other tall grass species and favour shorter fine-leaved grasses. Any loss of flower spikes through the presence of cattle does not result in the loss of the plant, but winter grazing would probably give rise to greater risk, given that the orchid leaves are produced in late autumn, exposed all winter to trampling / grazing, and die back around flowering time.

Undergrazing is a serious threat to *Ophrys fuciflora*, were it to occur. The coarse dense cover of Tor-grass if unchecked, may overbear adult plants and leave no opportunity for seedling recruitment. Eventually it leads to vegetative succession, with scrub building up, and then woodland. Conversely, over-grazing can be an issue, but this is primarily as regards rabbits. Loss of flower spikes may also occur through slugs (encouraged if Tor-grass becomes dense) and unfortunately loss of whole plants may occur through criminal activity: three were dug up at Cheriton Hill in 2016.



Ophrys fuciflora Kent records to 2024 mapped at tetrad level, from BSBI database.

Ophrys fuciflora is closely related to *Ophrys apifera*

(Bee Orchid), with which it hybridises, the only known British crosses not surprisingly being from East Kent. Hybrids, generally the odd plant or two, have been recorded from more or less the whole range of *O. fuciflora*: Wye, Postling, Parkgate Down, Shuttlesfield, Arpinge and the Folkestone Downs (most recently at Wye Bulltown in 2010 and 2014; and at Postling in 2010 and 2022). They are not easy to identify, especially in view of the variability of *O. fuciflora.* The species themselves may be separated by *O. fuciflora* having a larger, squarer lip, generally with more elaborate patterning, and a forward-pointing yellow appendage at the tip of the lip (the appendage points backward in *O. apifera* and so is scarcely visible from the front of the flower. The upper sepals of *O. fuciflora* are also more widely triangular.

Recent status of *Ophrys fuciflora* populations

Site	**Population estimate**		**Status**	
	2016	**2022**	**2016**	**2022**
Wye- Devil's Kneading Trough	5-10	1	Recent decline	Continued decline
Wye - Fishponds Down	20-30	17	Stable	Possible decline
Wye - Aldglose Down	50-100	104	Stable / possible increase	Possible increase
Wye - New Barn Coombe (Bulltown)	50-100	58	Recent decline	Stable / possible decline
Postling	150-200	49	Increasing	Decline
Parkgate	0-5	-	Decline/still present	Maybe gone
Shuttlesfield	10-20	9	Stable	Stable / possible decline
Arpinge	20-30	21	Recent decline	Stable
Folkestone - Cheriton Hill	100-150	59	Increasing	Decline
Folkestone - Cherry Garden	50-100	21	Increasing	Decline
Folkestone - Holywell	30-50	8	Stable/possible decline	Decline

To add to the table above, 2023 was a good year for the species, with 280 plants in flower at Wye and over 200 at Folkestone.

This account has benefited from the assistance of Alfred Gay, David Johnson and Phil Green who, between them, have very extensive experience of this species.

Ophrys insectifera L. (Fly Orchid)

vc 15 and 16

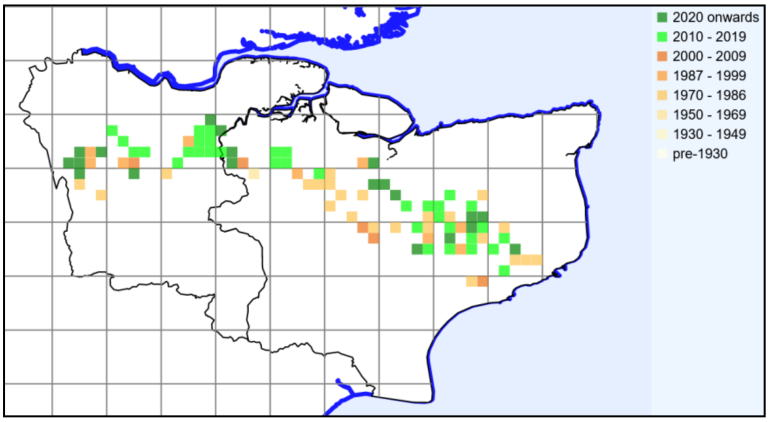
Rarity / scarcity status

Ophrys insectifera is fairly frequent in south England, with a scattered distribution reaching northern England, but largely absent from the south west and virtually so in Wales; present in central Ireland. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. The species is considered to be **Vulnerable** to the risk of extinction in England and Great Britain as a whole, its area of occupancy in England being taken to have declined by 37% in comparing records for the periods 1930-69 and 1987-99. It is supposed that losses are attributable to woodland clearance and to scrub encroachment and the closing of woodland canopies, although it grows well in dappled shade in Kent. There is some evidence of decline in the county, with a 42% reduction in tetrad records between 1971-80 and 1991-2005, although it is not yet rare or scarce. It is a Kent axiophyte and so is indicative of good habitat.

Yockletts Bank. Photos by Lliam Rooney, 21 May 2009

Account

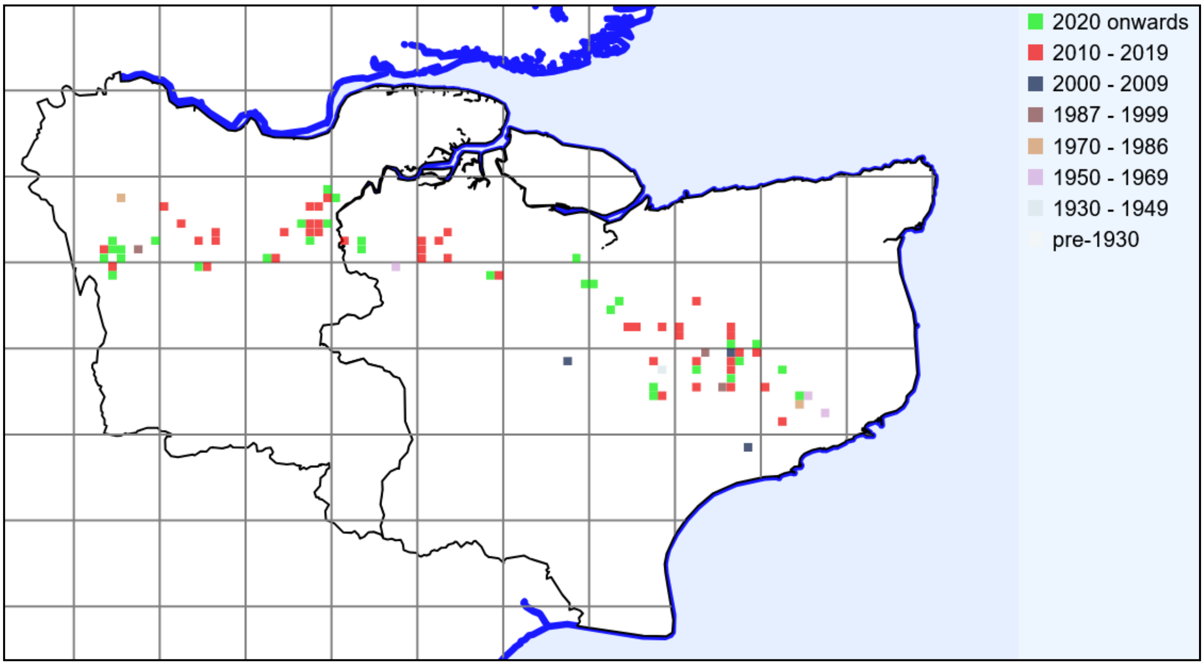
The first published record for the county was by John Gerard in his *Herball* (1597) where, with other orchids, it is said to 'growe upon barren chalkie hils and heathie grounds, upon the hils adioining to a village named Greene-hithe, upon long field downes by Southfleet, two miles from the same place, and in many other places of Kent'. The reference to 'heathie grounds' is a little difficult to understand in relation to this calcicole, but as Gerard was also referring to other orchids, amongst them the 'Butter-flie Satyrions', he may have included *Platanthera bifolia* (Lesser Butterfly-orchid), which has wider habitat tolerances. Clearly he regarded the Fly Orchid as not uncommon in Kent, and so did Hanbury & Marshall (1899), who considered it to be abundant in four of the ten botanical districts in the county, a common plant of woods, thickets, and their outskirts, on and near the chalk. From such abundance it came to be merely a locally frequent plant in Philp (1982), with records in 57 tetrads, following the chalk downs from one end of the county to the other. A further reduction, to 33 tetrads, came with the 1991-2005 survey published as Philp (2010), but this appears to be unduly pessimistic.



Ophrys insectifera **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Our 2010-24 records cover 54 tetrads (75 monads) over a broadly similar distribution, but also show a cluster of four tetrads just within metropolitan vc16, an area not included in Eric Philp's surveys. So the evidence still points to minor decline since 1971-80, but nothing like what Philp (2010) suggests, and the picture is probably more complex than this. David Johnson (*Wild Orchids of Kent*, 2019) has noted the loss of several colonies in north Kent in recent years, and a contraction in many extant populations; but this has been to some extent compensated by the establishment of some important populations in old chalk quarries and workings, especially in the Medway gap, although such areas themselves have been increasingly developed. The species may suffer from rabbit predation, at least as regards flowering stems: when rabbit fencing was installed at Mill Hill Wood, Ranscombe, 60 plants flowered in 2019 where no flowers survived in 2018. Current presence at higher resolution is shown in the monad distribution map below, historic records largely being lacking because recording at monad level was not generally adopted in Kent until 2010.

***Ophrys insectifera* Kent records to 2024 mapped at monad level, from BSBI database.**



Ophrys insectifera is currently noted in Kent normally as no more than half a dozen flowering spikes at a time; but there are larger populations, e.g. 90 at Mill Hill, Ranscombe (2013, 2021); over 50 at Trundle Wood (2010); about 50 near Broad Downs, Wye (2020); 37 at Burham Pit (2010); and 35 at Park Gate Down (2014). Counting plants is not straightforward as they are so inconspicuous, even when in flower.

Our recent records are all on chalk (including clay-with-flints over chalk), mostly in light woodland, often on or towards the edge, or in scrub; chalk grassland is a habitat, but generally at the margins with scrub or woodland. In other counties, it may be found in calcareous fen, but this does not appear to be the case in Kent. In woodland, it may be accompanied by *Mercurialis perennis* (Dog's Mercury); we have noted it with ash, beech and in hazel coppice. Sometimes it may be in quite dark habitats, but this is possibly a matter of survival from when light was not excluded to the same degree, e.g. as woodland grows out into a scrubby margin of chalk grassland. In lighter habitats, there may be issues of competition from rank vegetation if not restrained by the thinness of the soil over chalk or the management regime. Dappled shade in woodland or scrub with little under-storey appears to suit; but as with many other orchids, the significance of habitat may relate as much to the species' associated mycorrhizal fungus as to the plant itself.

These recent habitat observations accord well with those noted by Francis Rose in the 1940s and 1950s in relation to his specimens in **MNE**: finds were made mostly in coppice on chalk or in chalk scrub, but were also noted on chalk downs, in open chalky beechwood and in one case in coppice on Gault (Ryarsh Wood, 1936). Richard Moyse (personal communication) has noted at Ranscombe that Fly Orchid occurs under secondary woodland (at Mill Hill, this is woodland and scrub post-dating the 1987 storm), so that woodland management might best be served by managing a dynamic scrub/woodland succession, accepting that individual populations may wax and wane as succession proceeds.

Cross-pollination is well-known to be effected by male digger wasps (in Kent, by *Argogorytes mystaceus*), which are deceived by the flowers in attempting to mate with them and so pick up and transfer pollinia from flower to flower. The deception appears to arise both from the physical resemblance of the flower to a female wasp and to the emission of floral scent which has the effect of a sexual pheromone. This pseudo-copulation has been observed many times in Kent, in particular at Downe Bank KWT reserve (Johnson, 2008)[477] - ironically, in view of Darwin's failure to do so here. He was puzzled by the apparent lack of attractiveness of the flowers to insects, so far as his observations went, with relatively few flowers having had pollinia removed and with only a seventh of the flowers examined maturing into a capsule. Something, he felt, 'seems to be out of order in its mechanism or in its conditions'.[478]. The low seed set, however, appears to be characteristic of *Ophrys insectifera*; and it would have been a matter of chance whether Darwin might have been able to pursue more successful observations.

Surprisingly, it appears that male digger wasp visits appear to be most frequent late in the Fly Orchid's flowering season in Kent[479], even though the legitimate distraction of female digger wasps (which emerge some two weeks later than the males) would presumably be more available than earlier; so it may be that the pheromone effect of the floral scent intensifies as the orchid matures.

Ophrys insectifera hybridizes with *Ophrys sphegodes* (Early Spider-orchid), in spite of their habitat differences (the former being shade-tolerant and the latter preferring open chalk grassland), their differing flowering times and different pollinators. The only known British occurrences have been in East Kent, with discoveries at Wye Downs in 1905 and 1906 and by Francis Rose at Winchcombe Downs, Crundale in 1957.

Ophrys insectifera is not readily capable of being confused with other British orchids, although there is occasional variation in flower shape or colour.[480]

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[477] See the amply-illustrated account in Johnson, D. (2008). Wasp visits Fly at Downe Bank. *Kent Field Club Newsletter* **68**: 2-6.

[478] Darwin, C. (1862). *The various contrivances by which orchids are fertilised by insects*. London: John Murray.

[479] According to observations at Downe Bank by Grant Hazelhurst, noted in Johnson (2008), *vide supra*.

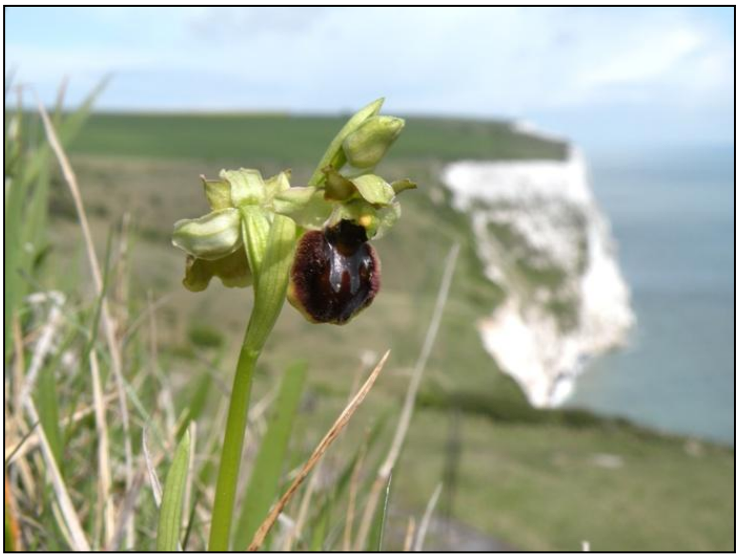
[480] Johnson, D. (2007). *Ophrys insectifera* var. *ochroleuca* in Kent. *Bulletin of the Kent Field Club* **52**: 89-92. Johnson, D. (2008a). Ophrys insectifera var. ochroleuca the "Yellow" Fly Orchid. *Kent Field Club Newsletter* **67**: 7-10. Johnson, D. (2008b). More Kentish orchid variants. *Kent Field Club Newsletter* **68**: 11-15. Also *Kent Botany* (2021).

Ophrys sphegodes Mill. (Early Spider-orchid)

vc 15; formerly in vc16

Rarity / scarcity status

Although it was formerly more widespread, Early Spider-orchid is now primarily a plant of coastal calcareous grassland, especially in Kent, East Sussex and Dorset. It is **nationally scarce** and protected from picking and sale under Schedule 8 of the Wildlife & Countryside Act 1981. It has been regarded as a Red Data Book species with Near Threatened status, but its current conservation risk is one of Least Concern, both in England and in Great Britain as a whole. This reflects the relative stability of its distribution for the period 1930-99, although the inclusion of pre-1930 data would show substantial historic decline. In Kent, there are some 25 or so colonies; the species is neither rare nor scarce, albeit very local, and the Kent populations are significant in a national context.



Langdon Cliffs. Photo by
Sue Buckingham, 28 April 2009

Account

The first published record for Early Spider-orchid in Kent could well be John Ray's reference to *Orchis arachnitis* at '*Northfleet in Kent'* in his *Catalogus Plantarum Angliae* (1670), although this is treated separately from a Cambridgeshire taxon which clearly fits the Early Spider-orchid, viz. the '*Humble Satyrion with green wings',* (so differentiating from *Ophrys apifera* (Bee Orchid) with its pink sepals). Later on, in the third edition of Ray's *Synopsis Methodica Stirpium Britannicarum* (1724), edited by Dillenius, *Orchis arachnitis* is omitted, but the Northfleet location is attributed to the "*Humble Bee Satyrion with green Wings*", said to be flowering in April and common enough on chalk hills around Northfleet. So it may be that we should read all these as references to the same taxon.

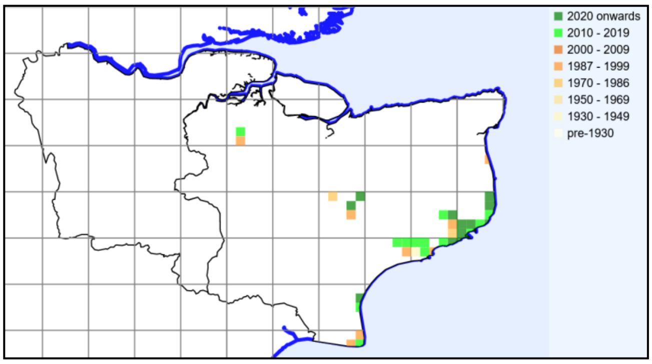
The position is not helped by the confusion between Early and Late Spider-orchids which subsisted until sorted out by G.E. Smith in his *Catalogue of rare and remarkable Phaenogamous Plants, collected in South Kent* (1829), following an examination of over 200 specimens, mostly gathered from Hartlip (presumably Queendown Warren). His conclusions were that the Early Spider-orchid covered a range of variation into which should be sunk what botanists had been treating as a separate species, *Orchis fucifera* (Drone Orchid); but that there was also another taxon present, the Late Spider-orchid (then called *Ophrys arachnites*), which was added to the British flora as a result of Smith's researches.

As well as receiving Queendown Warren specimens, Smith was aware of Early Spider-Orchid growing on the Folkestone Downs near Cherry Garden; on the chalk slopes by Lydden Spout and beyond St Margarets Bay. Other early records indicate a range across the county including, in West Kent, the chalk at Greenhithe (Pocock, 1820); and in East Kent, Selling, near Faversham (Jacob, *Plantae* Favershamienses, 1777). Hanbury & Marshall (1899) regarded it as locally plentiful on downs, rough banks and pits on the chalk. Francis Rose, writing in the 1940s-60s, considered it then rare, but locally very abundant at Queendown Warren (where there were usually 500-1,000 plants, 1938-62) and present near Wye and in many places near the coast between Etchinghill and Deal. It was then apparently extinct in West Kent, the last record being a report from South Street, Biggin Hill, in 1947. High counts were noted by Francis Rose at Abbot's Cliff (hundreds on rifle range above, 1943-53); the downs on top of Shakespeare Cliff (hundreds, 1948-62); Temple Ewell (hundreds, 1948-60 and 2,000 flowering plants in 1989). In spite of the number of records given by Francis Rose, mostly for the 1940s and 1950s, this was a time when arable cultivation had increased, accounting for the loss of the orchid's downland habitat, and afterwards modern farming methods enabled the plough to come closer to the cliff edge, with the loss of some Kentish cliff-top colonies (David Johnson, *Wild Orchids of Kent*, 2019).

Samphire Hoe. Photo by Lliam Rooney, 19 May 2010

The general trend in historic Kent occurrences has accordingly been a reduction in the number of sites to Queendown Warren, Wye and the east coast, with Philp (1982) treating the species as very local and rather rare, the number of flowering spikes varying from year to year. Just after the end of the 1971-80 survey published as Philp (1982), Francis Rose prepared a *Report on the populations of Ophrys sphegodes in south east England in May 1983* (unpublished), based on an attempt to survey every known population in East Sussex and East Kent over four days, in most cases by lining up helpers along a base line and getting them to walk in parallel across the site. Possible sites amounted to 27 in East Kent with definite records since 1945, but only 11 were visited in the course of the survey, with plants seen at ten sites[481]. The estimated total number of plants for East Kent was 3,780.

Ophrys sphegodes Kent records to 2024 mapped at tetrad level, from BSBI database.



The total of tetrad records given in Philp (1982) was 16; in Philp (2010), it was 21, with basically the same distribution. Our 2010-24 records have exceeded both earlier surveys, with 27 tetrads (36 monads), which appear to suggest a degree of stability in distribution, maybe some improvement; but there are both negative and positive qualifications to this.

First, data based on presence/absence alone do not register the strength of a population; and it is apparent that the Queendown Warren colony is declining. Despite the numbers given by Francis Rose (up to 1,000 plants) and the statement in Philp (1982) that this was the strongest colony in the county, the annual count is now less than 20 plants (David Johnson, *Wild Orchids of Kent*, 2019). Conversely, a monad at Kingsdown where the species has been recorded without numbers, in 2020 was found to harbour 585 flowering spikes, perhaps the second largest colony in the county.

Secondly, on the positive side, a new colony has developed at Samphire Hoe, now one of the largest in the British Isles. This is an undercliff area of 30 hectares reclaimed from the sea by the deposit of chalk spoil from the construction of the channel tunnel. Work began in 1988, the last spoil lagoon was completed in 1990, landscaping took place in 1993 and the area was opened as a country park in 1997. The first *Ophrys sphegodes* here was found in 1996, which gives very little time for it to have germinated and reached flowering stage, particularly if the 'start date' should be regarded as in 1993. Orchids often develop in their early stages with the benefit of mycorrhizal associations, and the bare chalk seems unlikely to offer much of this nature, but *Ophrys sphegodes* is capable of germinating asymbiotically, at least in the laboratory (albeit responding to nutrients unlikely to be present in the bare chalk), which is suggestive in relation to Samphire Hoe, and various chalk-pit records. However, the standard ecological account of this species[482] notes the presence of mycorrhiza on the roots of *Ophrys sphegodes,* so this may have a part to play after all. Following germination (one to two months in the laboratory), it can take up to two years as an underground protocorm before first emergence (by no means as long as many orchids) and then is fairly short lived. Accordingly, its strategy appears to be that of a weedy species, relatively quick to take advantage of bare ground.

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[481] The ten sites were: Queendown Warren, TQ830630 (300 plants est.); Winchcombe Down, TR088494 (300 plants); Wye Crown Down, TR071466 (11 plants); Dover Hill Folkestone, TR237376 (2 plants); Farthinghoe Down, TR297395 (366 plants); Langdon Cliffs, TR333420 to TR345425 (850 plants est.); Temple Ewell Down, TR279451 to TR276455 (1653 plants); Old Park Hill, TR300434 (40-50 plants); South Foreland, TR366436 (237 plants); Dover Patrol Memorial, TR375452 (14 plants). Data are also given for the 16 unvisited sites with post-1945 records, many of which were suspected still to carry plants.

The single orchid became 61 plants in 1998[483], with 25% of the capsules setting seed (there can be 5,000 to 10,000 seeds per capsule). There were over 12,000 by 2006 and still 11,500 by 2012; 10,300 by 2014. The total of 3,500 in 2015 was adversely affected by rabbits; and a count of 4,500 in 2016 represents a degree of recovery. The site may offer advantages through the species being more salt spray-tolerant than had previously been considered, although of course cliff populations need such tolerance. A further advantage is the nutrient-poor, sharp-draining substrate which reduces competition as well as enabling the Early Spider-orchid to complete its cycle of flowering, seed setting and dying back to a dormant state before the warmest part of the year when the stresses of the habitat will be greatest.

Samphire Hoe. Photo by LliamRooney, 19 May 2010

The Samphire Hoe habitat in a sense extends the characteristics of the more usual Kent locations of very short grassland on south-facing slopes with some exposure of the chalk substrate, whether due to erosion or to grazing activities and light stock trampling (noting, however, that in Sussex, cattle grazing has proved damaging to colonies whereas sheep grazing, other than in the period of flowering and seed set, is beneficial). But Early Spider-orchid is in Kent also capable of colonising stabilised shingle, as it has been present in this habitat at Kingsdown at least since 1998 and in various places at Dungeness since 1995.

Recognised grassland communities in which the species may occur include *Festuca ovina–Avenula pratensis* grassland (CG2), especially the *Succisa pratensis–Leucanthemum vulgare* (CG2b) subcommunity, although further Kent data would be useful. We have a *Brassica oleracea* maritime cliff-edge grassland community (MC4), of which there is an *Ononis repens* (MC4b) subcommunity, found only in Kent and Dorset, and of which *Ophrys sphegodes* is an occasional constituent. *Ononis repens* (Common Restharrow), *Centaurea scabiosa* (Greater Knapweed), *Rumex acetosa* (Common Sorrel) and *Silene nutans* (Nottingham Catchfly) are constant associates.

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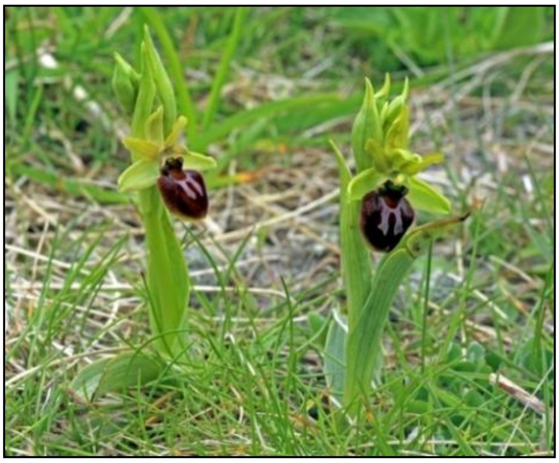
[482] Jaquemyn, H. & Hutchings, M.J. (2015). Biological Flora of the British Isles: *Ophrys sphegodes. Journal of Ecology* **103**: 1680-1696. This paper has also been the source of much other information in this account.

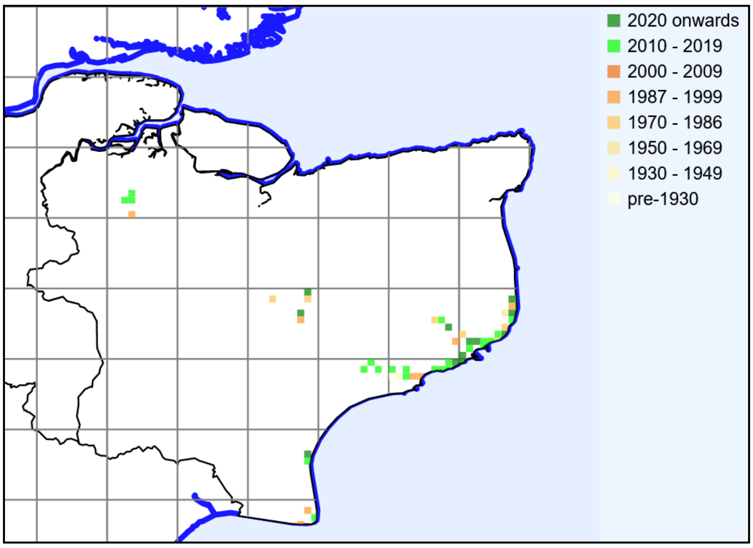
[483] Gay, P. & Philp, E. (1999). Early Spider Orchids at Samphire Hoe, Dover. *British Wildlife* **10***:* 165.

Despite the early flowering of Early Spider-orchid, hybrids have been recorded in Kent (and nowhere else in Britain) with *Ophrys insectifera* (Fly Orchid) at Wye Downs (1905 and 1906), Olantigh, Wye (1913); and Crundale (1956-60). Crosses are also known from Kent (but again not elsewhere in Britain) with *Ophrys fuciflora* (Late Spider-orchid), first recorded by G.E. Smith as collected by a Mr Lee on the downs between Newington and Lyminge. Smith then remarked that he had seen both species flowering at the same time on 17 May 1828 (an experience replicated by E.S. Marshall on 1 June 1882), whereas normally their flowering periods would be distinct (April to mid-May v. late May to July). A Folkestone plant (1930) may have been this cross, as also plants reported to Francis Rose at Cheriton Downs (1945) and east of Etchinghill (L.J. Margetts, 1958); and this identity has also been claimed for a plant photographed, perhaps at Wye, in 1984. The hybrid between *Ophrys sphegodes* and *Ophrys apifera* (Bee Orchid) was, according to Hanbury and Marshall (1899), considered to be the identity of fresh plants sent in 1889 by G.L. Bruce of the Toynbee Hall Natural History Society (part of a movement to encourage education and citizenship in London's East End), gathered at Magpie Bottom, Shoreham. This find is very surprising, given the absence of any other record of *Ophrys sphegodes* from that locality or anywhere near it; although the same recorder was responsible for the perceptive discovery of *Polygala amarella* (Dwarf or Kentish Milkwort) at that location. Nevertheless, the record is generally treated as unconfirmable and the cross does not appear in modern Floras, although France Rose in his manuscript *Flora* noted it at Folkestone Downs and Cheriton Downs, without comment, and considered that a plant which may have been the cross grew at Brook Hillock, Wye, 1942-58.



Samphire Hoe. Photo by David Steere, 22 April 2016

For hybrids to arise, evidently cross-pollination must occur, and the usual pollinator for *Ophrys sphegodes* is the male solitary bee *Andrena nigroaenea*, of which numerous specimens were seen during the 1998 investigations at Samphire Hoe. They were reported as flying fast and erratically about the orchid colony, engaging in pseudocopulation and showing evidence of attachment of pollinia. The attraction to the male bees is principally the scent of the flowers, which mimics that of females and so encourages an attempt at mating which may bring about pollen transfer. Indeed, there are scent differences between pollinated and unpollinated flowers, which make this quite a sensitive mechanism. However, this could be threatened by climate change resulting in warmer springs, as it seems that flight emergence of female bees is more responsive to spring temperature than the flowering of *Ophrys sphegodes*; so that if female bees have emerged before orchid flowers, male bees may be less likely to be deceived into pseudocopulation with the flowers.



Ophrys sphegodes is quite variable in the shape and colouration of the lip of the flower which, as with other *Ophrys* species, resembles the abdomen of an insect. The lip, however, lacks the light-coloured markings of *O. apifera* and *O. fuciflora*, and the sepals are yellowish-green, rather than the pink of the other two species.

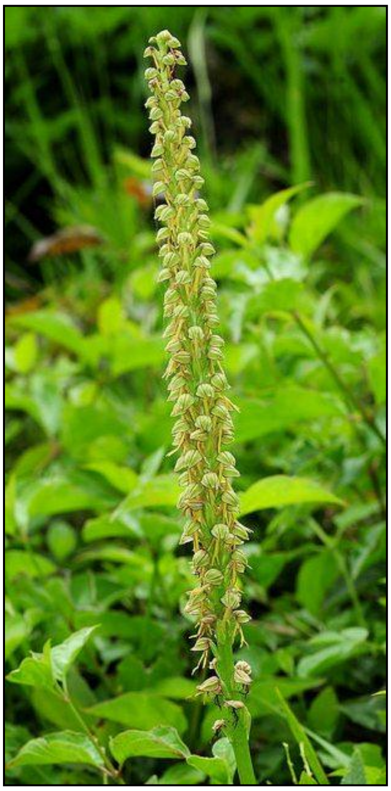
Ophrys sphegodes **Kent records to 2024 mapped at monad level, from BSBI database.**

Orchis anthropophora (L.) All. (Man Orchid)

vc 15 and 16

Rarity / scarcity status

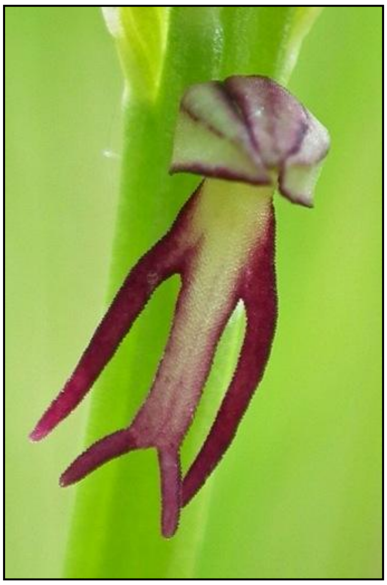
Man Orchid grows locally on chalk or limestone in south east England, with few records further north, but not beyond Lincolnshire. It is treated as an **Endangered** species in both England and Great Britain as a whole, on account of its area of occupancy in England being taken to have declined by over 50%, with a downward trend also in extent of occurrence, in comparing records for the periods 1930-69 and 1987-99. However, if one takes data from 1987 onwards as a proportion of all records (including those before 1930); then the national decline would be assessed at 70%. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006, formerly treated as a UK Biodiversity Action Plan priority species threatened by loss of woodland glades, eutrophication and overgrazing. It is a Kent axiophyte and so is indicative of good habitat. Whilst it is **nationally scarce**, In Kent the species is still widespread and fairly frequent, and so it does not qualify here as rare or scarce. The orchid's importance in the county is as supplying the core territory for the species in the British Isles; nowhere else is it so well represented.



Mill Hill, Ranscombe. Photo by LliamRooney, 9 June 2010

Account

The first published Kent record is given in the third edition of John Ray's *Synopsis* edited by Dillenius: the '*Man-Orchis with a ferrugineous and sometimes a green Flower* ...At *Greenhithe* and Northfleet in *Kent*, with...Mr. *J. Sherard'.* Hanbury & Marshall (1899) considered the species to be locally abundant in woods, thickets and downs on the chalk, so that they did not give any individual records for the botanical districts covering the North Downs across the whole county, where it was said to be frequent. For Francis Rose, writing in the 1940s-60s, the orchid was widespread on the North Downs and quite common from the Surrey border to a line from Wingham to Denton, Elmsted and Wye, but rare east of this. It was, he considered, very common locally, with greatest abundance being on the chalk from the Darent valley to the Wye downs towards the coast. He knew of 142 localities on the Kent chalk.

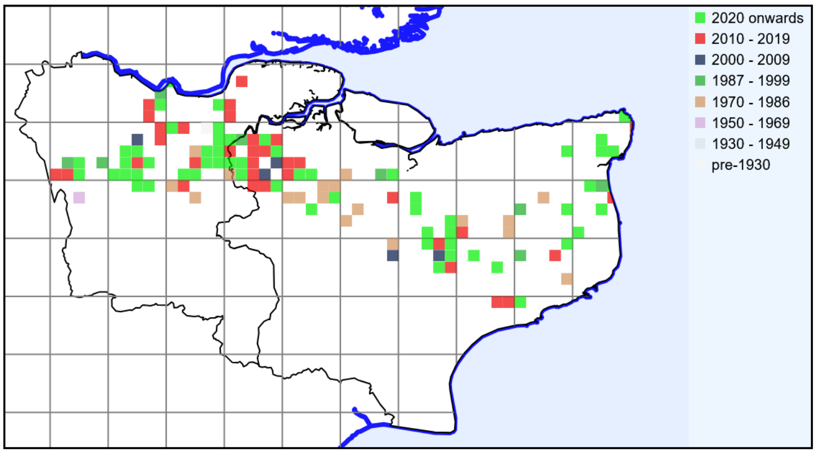


Philp (1982) treated it as locally frequent, found in 65 tetrads in rough grassland on downland, wood margins, along hedgerows and roadside banks, and occasionally in open woodland. Philp (2010), however, found presence in only 45 tetrads, with some sites having lost the species through ploughing, spray drift or inappropriate management.

Luddesdown. Photo by David Steere, 10 May 2015

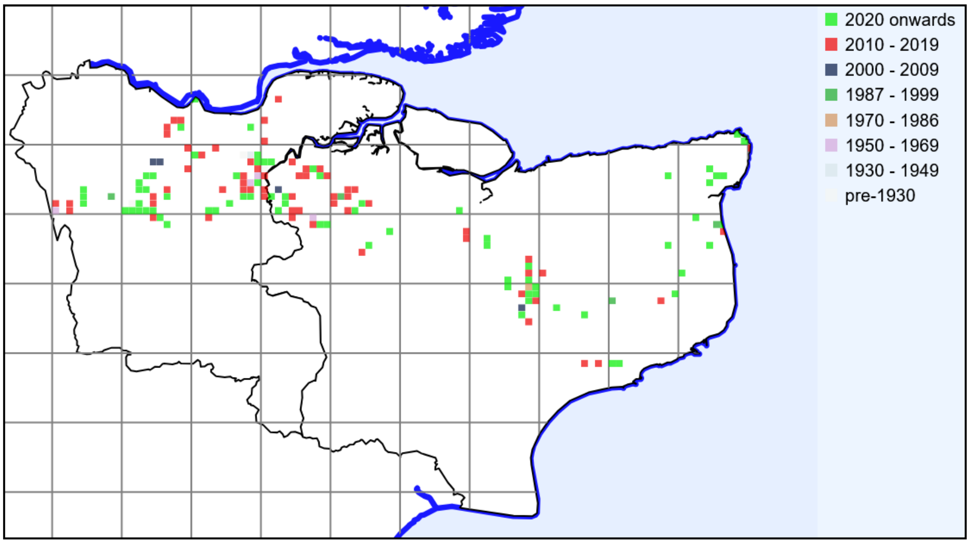
Records for 2010-24 amount to 92 tetrads (134 monads), significantly more than was recorded even in the 1971-80 survey, let alone the later one. This is 61% of the total number of tetrads in which it was recorded in the British Isles for that period, according to the BSBI database, underlining the national importance of Kent's colonies.

Distribution mapping below shows remarkable concentrations around the Medway towns and the Medway gap, the Darent valley and the Wye/Crundale area, current records being best viewed at monad resolution, a level of recording which superseded tetrads around 2010.



***Orchis anthropophora* Kent records to 2024 mapped at tetrad level, from BSBI database.**

***Orchis anthropophora* Kent records to 2024 mapped at monad level, from BSBI database.**



Whilst losses had no doubt occurred, it is likely that some of the apparent change between 1971-80 (Philp, 1982) and 1991-2005 (Philp, 2010) is a product of recording methods. The former survey was undertaken by a network of Kent Field Club recorders and the latter by Eric Philp alone: orchid records in particular appear likely to be collected more thoroughly by crowd-sourcing. However, there may be fresh recruitment: the 2010-24 records include some locations which were in neither earlier survey.

So far as losses are concerned, the persistence of old colonies was tested in the BSBI's Threatened Plant Project, in which recorders were invited in 2012 to re-find the species at the site of old records randomly selected. Five sites in West Kent were allocated, and six in East Kent. Only two out of the six East Kent sites yielded the orchid (one a golf course, the other a KWT reserve); no pattern of loss was identified, but one former quarry had become a landfill site. All the West Kent sites were re-found, even one which had presumably been originally an open chalk roadside bank but which had since become completed covered by scrub with ivy ground cover and no grass; several Man Orchids still survived there. The re-finding proportion (64%) was better in Kent than sites selected in other counties where the find rate appears to have been four out of eleven (36%)[484]. It is curious that the success rate in re-finding, as also the concentration of records (if one includes the area just east of the Medway valley as well), is greater in West Kent than East. As a species with a European distribution which is primarily southern (Italy, Spain, Portugal and south France), it reaches the edge of its range with the British Isles. One might therefore expect it to be more common in East Kent and indeed the Sussex Downs, but the anomaly is greater than this, in view of its scarcity in northern France.

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[484] This produces the 50% overall figure (11 out of 22) given in Walker, K.J., Stroh, P.A. & Ellis, R.W. (2017), *Threatened plants in Britain and Ireland*, Botanical Society of Britain and Ireland, Bristol).

Darland Banks – habitat.
Photo by David Steere, 4 May 2014

The relatively healthy position of Man Orchid in the county is also reflected in the colony at Darland Banks KWT reserve, perhaps the largest in Britain now that the main Northamptonshire colony has declined: regularly numbering in the thousands, with over 7,000 plants recorded in 2009, over 4,000 in 2012 and 2013, and over 15,500 in 2024. Darland Banks presumably represents ideal habitat: steep, south west facing chalk slopes with short, conservation-grazed turf. Elsewhere in Kent it is often found at the top of chalk grassland slopes where scrub is creeping out from woodland above; this transitional zone may move down if the scrub is unchecked and the orchid may then be subsisting in an increasingly shady habitat, for which it has some tolerance. At Ranscombe it has even been seen (2015) flowering in heavy shade under beech, in spite of the received wisdom that it is rarely found in situations in which the relative illumination falls to below 70% of full sunlight[485], but it may be that flowering activity in this case was affected by behaviour of a fungal symbiont. Although the great majority of occurrences are on chalk, Francis Rose noted it in 1961 at the old ragstone quarry at Dry Hill, Sundridge and (undated) as reported from a railway cutting on Gault Clay near Leeds. He also knew it on the calcareous fixed dune grassland at Sandwich Bay from 1951 to 1999 and G.E. Smith recorded it (c. 1830-32[486]) on the Greensand between Malling and Maidstone, two to three miles from the chalk.

Eynsford. Photo by David Steere, 13 May 2016

The Darland Banks population has been the subject of varying grazing regimes in different compartments[487]. Over much of the site, traditional winter grazing has sufficed to keep scrub and rank grasses under control. In other parts, however, a more intensive grazing regime (winter to late spring and late summer grazing) has been considered necessary to cope with the greater vigour of the plants requiring control. Monitoring of Man Orchid numbers over the period 2014-17 indicates that, although there are fluctuations from year to year, most likely influenced by general climatic conditions, these are proportionate as between the areas subject to different grazing regimes. Accordingly, it would appear that the severity of grazing does not affect the numbers of orchids, at least in the short term (the longer term position as regards continued recruitment of a population remains to be tested).

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[485] Jacquemyn, H.. Brys, R. & Hutchings, M.J. (2011). Biological flora of the British Isles: *Orchis anthropophora* (L.) All. (*Aceras anthropophorum* (L.) W.T. Aiton). *Journal of Ecology* **99:** 1551-1565.

[486] In manuscript notes to his copy of a *Catalogue of rare or remarkable Phaenogamous plants collected in South Kent* (1829).

[487] Rutyer, A. (2018). Man Orchids at Darland Banks. In *KWT: Ecology and evidence, winter newsletter 2017/18.*

Kent populations often show a degree of clustering within their larger extent, sometimes involving quite dense aggregations. For example, a roadside colony near Bluewater has produced over 100 flowering spikes in an area not exceeding three square metres (David Johnson, *Wild Orchids of Kent*, 2019). The natural assumption would be that this is a result of vegetative reproduction, although the Biological Flora of the British Isles[488] account considers that the species shows limited or no vegetative spread, each plant's tuber being wholly replaced by a new one annually while the plant survives, only 'in some cases' does the old tuber persist so as to produce a new rosette as well as the new tuber.

Associated plants growing with Man Orchids found in the course of the BSBI's Threatened Plant Project (TPP) survey (2012) of Kentish sites were characteristic of chalk grassland with a scrub component. All sites held *Brachypodium*, but in the case of West Kent it was *Brachypodium sylvaticum* (False-brome) and for East Kent it was *Brachypodium pinnatum* agg. (Tor-grass). All but two sites held *Origanum vulgare* (Wild Marjoram), *Crataegus monogyna* (Hawthorn) and *Rosa* sp. (sometimes identified to *R. canina* or *R. canina* agg.), and the next most often recorded taxa were *Carex flacca* (Glaucous Sedge) and *Poterium sanguisorba* subsp. *sanguisorba* (Salad Burnet). Among British plant communities, Man Orchid is considered[489] to be mostly confined to *Festuca ovina–Avenula pratensis* grassland (CG2), especially the *Succisa pratensis–Leucanthemum vulgare* (CG2b) subcommunity, which consists of a mainly closed sward in which *Cirsium acaule* (Dwarf Thistle)*, Asperula cynanchica* (Squinancywort) and *Hippocrepis comosa* (Horseshoe Vetch) are frequent species. However, these community characteristics do not give sufficient weight to the scrub component observed in the TPP survey, and none of the last three species (or the species after which the subcommunity is named) was observed in the immediate vicinity of the targeted orchid, except (twice) *Hippocrepis comosa*, although all species would not have been out of place.

Man Orchid may be found growing with other orchid species, and in Kent has been found to hybridise with two of them, both in the genus *Orchis*, and so implying a closeness of relationship which supports the transfer of Man Orchid from *Aceras* to *Orchis*.

A cross with *Orchis simia* (Monkey Orchid) at the latter's native site near Faversham was found by Richard Bateman in 1985[490]; the two parents were known to have flowered a few centimetres apart for several years. Two hybrid plants were still present in 1992, but some doubt attached to hybrid origin, as hand-pollination of the *Orchis simia* population had been carried out into the 1980s which could have given rise to artificial cross-pollination[491]. However, the occurrence of a further hybrid in 2016 strengthens the case for natural hybridisation. The scope for natural hybridisation between these species and *Orchis purpurea* at Faversham has been studied by David Roberts (the *simia*/*purpurea* cross is not known here, although known as a hybrid swarm at Hartslock, Oxfordshire). He found from 51.5 hours of inflorescence observations in 2022-23 that, across all three species, there were 52 insect visitors but no pollinators (i.e. no transfer of pollinia observed). The visitor rate per inflorescence was 6-8 times higher for *O. simia* than for the other species. A total of 14 species of visitors was recorded for *O. simia*, six for *O. anthropophora* and eight for *O. purpurea*, the most frequent visitors being hoverflies (67% for *O. simia*, 56% for *O. anthropophora* and 71% for *O. purpurea*).

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[488] Jacquemyn, H. et al., cited above.

[489] Jacquemyn, H. et al., cited above.

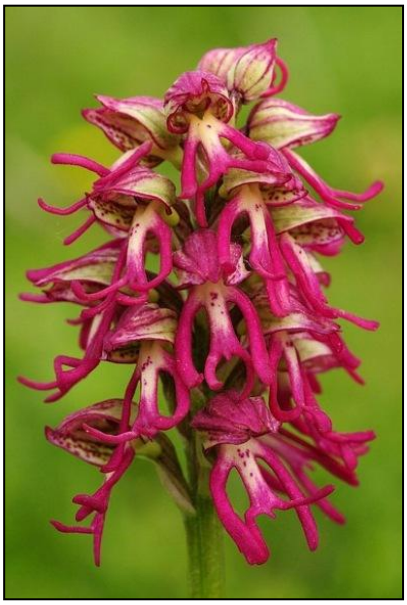
[490] Bateman, R.M. & Farrington, O.S. (1997). A morphometric study of X *Orchiaceras bergonii* (Nanteuil) Camus and its parents (*Aceras anthropophorum* (L.) Aiton f. and *Orchis simia* Lamarck) in Kent. *Watsonia* **16**: 397-407.

[491] The element of doubt is addressed in favour of natural hybridisation in Johnson, D. (2023). Hector Wilks and the Monkey Orchid (*Orchis simia*). *Transactions of the Kent Field Club* **22**: 35-48. Apparently hand-pollination was carried out by the Wilks family, who denied any artificial crossing and, indeed, had no reason to undertake it.

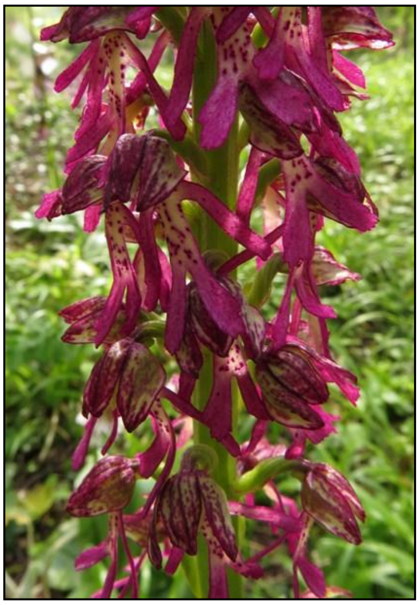
Fruiting success for the three *Orchis* species was low but varied: *O. simia* 3.9% in 2022, 3.5% in 2023 (but greater in open grassland than shrubby terrain); *O. anthropophora* 19.6% in 2022, 30.1% in 2023; *O. purpurea* 11.9% in 2022, 22.5% in 2023. In terms of hybridisation opportunity between the species there is a flowering overlap between all, but greater between *O. simia* and *O. purpurea* than between *O. simia* and *O. anthropophora*, even though it is the latter pair which has hybridised here. The insect visitor overlap is the opposite, although pollen transfer was not observed. Overlap of physical occurrence is limited by habitat preferences at the site with *O. anthropophora* being found in open ground near woodland except for one plant in woodland; *O. purpurea* being found in woodland except for 2-3 flowering individuals along the woodland border; and *O. simia* being mostly found on the opposite side of the site, but increasingly located in the open area and some in woodland, but away from *O. purpurea*.

Man Orchid has also hybridised with *Orchis purpurea* (Lady Orchid) in private woodland with glades on chalk in East Kent, the only site in the British Isles, where two plants were discovered by Francis Rose and Owen Davis in 1998. Hybrid plants have continued at this location, at least two for many years, increasing to five, then (2018) seven, perhaps benefited by wire mesh fencing from rabbit depredations; then nine (2019). The seven 2018 plants included two colour forms, one rose-pink and the other(equating to Francis Rose's description) purple, suggesting at least two hybridisation events. The two additional 2019 plants were different in colour and lip shape, suggesting two further hybridisation events. The parents have been abundant in the vicinity, a count at the site when there were five hybrids giving 275 *Orchis purpurea* and 121 *Orchis anthropophora*. Third-hand reports indicated that several hybrid plants flowered in 2022 and 2023.

Orchis anthropophora is not readily confused with any other British orchid. Although *Coeloglossum viride* (Frog Orchid) – considered extinct in Kent – has flowers which can be similarly yellowish-green, their lip is only shortly divided, whereas the lip of *O. anthropophora* has the terminal and lateral lobes which are the 'man' of Man Orchid. The Frog Orchid's inflorescence is also much shorter. There is a degree of colour variation in the Man Orchid flowers, which are normally greenish-yellow, often with a reddish-brown tinge; but they have been seen rarely in Kent as lacking anthocyanin, and so with the 'hood' or 'helmet' plain green and the lip yellow; or, more frequently, with a high quantity of anthocyanin, when the lip may be suffused red. The variation does not seem to have taxonomic significance (although the anthocyanin-lacking plant has been given a varietal name); and is not obviously induced by habitat conditions – a possible association with open ground has not been borne out by David Johnson's observations in Kent (*Wild Orchids of Kent*, 2019).



Near Faversham, *Orchis* x *bergonii* (*O. simia* x *anthropophora*). Photo by LliamRooney, 16 May 2016



East Kent, *Orchis* x *meilsheimeri* (*O. purpurea* x *anthropophora*). Photo by Daphne Mills, 15 May 2015

Orchis purpurea Huds. (Lady Orchid)

vc 15 and 16

Rarity / scarcity status

Orchis purpurea has only a very few scattered sites in southern England outside Kent, and its rarity elsewhere contrasts strongly with its frequency in Kent. It is treated as **Vulnerable** to the risk of extinction in England and in Great Britain as a whole. The vulnerability designation in England arises on account of its area of occupancy being taken to have declined by 44%, and the extent of its occurrence having fallen by 34%, in comparing records for the periods 1930-69 and 1987-99. It is a **nationally scarce** plant and although there may have been some decline in Kent, mainly before 1930, it is locally frequent in the county. The importance of its conservation in Kent lies in the significance of its populations in the context of the British Isles as a whole. In 2020 it was appointed under the Kent Biodiversity Strategy as a Kent-specific threatened and iconic species. It is a Kent axiophyte and so is indicative of good habitat.

Bonsai Bank. Photo by David Steere, 29 May 2014

Account

The first published record in Kent is probably that by Christopher Merrett in his *Pinax rerum naturalium Britannicarum* (1666): '*Orchis* militaris polyanthos, on *Gad's-hill* in *Kent'*. The Military Orchid and the Lady Orchid were not well distinguished at the time and although Merrett appears to be naming the former, it is far more likely that the latter was encountered (not necessarily by Merrett: he took many of his localities from manuscripts of John Goodyer and investigations by others). Indeed, the woodlands nearest to Gadshill (i.e. within 1km) are currently Court Wood, Peartree Wood and Great Crabbles Wood, at the latter of which Francis Rose knew the orchid from 1944 to 1955, noting it there in 1991 also. David Johnson and Eric Philp, following up a record in Philp (1982), found a non-flowering rosette at Peartree Wood in 1997. The original 1666 site was likely to have been north or north east of the current extent of Great Crabbles Wood and closer to the Gravesend-Rochester road at Gadshill (judging from Robert Pocock's 1812 finds[492], one by a chalk pit, another at Chapel Wood which adjoined the road, both since lost to development), and Peartree Wood is likely to have been very close: such continuity is remarkable.

If, however, one sets aside the 1666 record for ambiguity, the next earliest record is given in Dillenius' third edition of John Ray's *Synopsis Methodica Stirpium Britannicarum* (1724): 'At *Northfleet* near *Gravesend*…Mr. *J. Sherard'*. A specimen is in Dillenius' herbarium, which G.C. Druce confirmed and took to be gathered from the same place.[493] These historic records are the earliest for the British Isles as well as Kent.

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[492] Arnold, G.M. (1883). *Robert Pocock: The Gravesend Historian, Naturalist, Antiquarian, and Printer*.

[493] G.C. Druce (1907). The Dillenian herbaria : an account of the Dillenian collections in the herbarium of the University of Oxford, together with a biographical sketch of Dillenius, selections from his correspondence, notes, &c. There was, however, also a specimen from Northfleet which Druce identified as *Orchis militaris* (Military Orchid), so the position is not straightforward.

Hanbury & Marshall (1899) assessed *Orchis purpurea* as still locally plentiful in woods and on bushy banks on the chalk 'although, like all the choicer orchids, it is much less common than formerly'. They gave many localities, but in the case of the botanical districts covering the North Downs and their hinterlands from Rochester to Dover, these were too numerous to mention individually. Another measure of its abundance was that Anne Pratt wrote of it as 'often carried into the towns in baskets for sale'[494], but what is really surprising is that Jocelyn Brooke echoed that experience so much later in his *The Wild Orchids of Britain* (1950), claiming that this was 'a regrettable practice which still, unfortunately, survives among the local hawkers, who sell this beautiful orchid at street corners (at sixpence a bunch)'.

Francis Rose in his manuscript Flora reckoned that there were some 130 localities in Kent where the plant still occurred. It is not clear exactly when this statement was written: probably around 1960, certainly later than 1948, when he wrote[495] that there were over 90 localities. In about 25 of the 130 localities, Lady Orchid was abundant, with 100-400 flowering spikes in 'good' seasons. It grew in scrubland, woodland (both beech forest and coppice), and, more rarely, grassland on chalk, being widespread on the North Downs from near Knockholt in the west to Betteshanger , Waldershare and Dover in the east, and locally frequent and locally abundant near the Medway Valley and on the chalk from Wye to the coast. Exceptionally, it was known on Gault Clay in a wood west of Brabourne (1946-61) and at Postling Wents (c.1990); but it is possible that downwash from the chalk may have influenced surface geology. It had then become very rare from Meopham westwards, and absent from much of the chalk between Frinsted and Milstead on the west and Challock on the east.

Bredhurst. Photo by David Steere, 7 May 2015

Philp (1982) stated that the species had recently disappeared from several localities, mainly through destruction of its habitat, remaining present (sometimes quite frequent) in 48 tetrads. Those 48 had become 44 by the time of the 1991-2005 survey published as Philp (2010), although no comment was made as regards decline.

Records for 2010-24 give 55 tetrads (86 monads) and so suggest relative stability of distribution. The recorded tetrads are, however, not identical as between 1991-2005 and 2010-24. In particular, there are two recent West Kent records outside the earlier distribution. One is on the chalk near Otford and is far more westerly than usual, although there appears to have been continuity as regards this colony and its size at least since 1949. The other, a single plant at One Tree Hill, Sevenoaks, (2011-12) was truly anomalous, having been well away from the chalk, on the lower slopes of the Greensand Ridge, on the Hythe Formation. The constituent rocks can include some calcareous content, but it was not evident that any other flora had been influenced by this.

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[494] Pratt,A. (n.d., but first published 1866). *The Flowering Plants and Ferns of Great Britain*, vol.5.

[495] Rose, F. (1948). Biological flora of the British Isles: Orchis purpurea Huds. *Journal of Ecology* **36**: 366-377.

From the 2010-24 records the most substantial colony was at Bonsai Bank near Petham (TR1051) where there were thousands of plants in 2010 on a chalk bank, responding to recent scrub clearance, and still 3,481 plants in 2013. However, there were also at least 300 flowering plants in private woodland in TR0452 in 2016; 299 at Stockbury (TQ8360) in 2017; 200-300 at Yockletts (TR1247) in 2010; 110 rosettes and 35 flower spikes at Burham Downs (TQ7362) in 2010); and 100 in woodland near Adisham (TR2152) in 2012. (See also later in this account as regards populations assessed 2020-24.) Most recent records were in woodland, often the edge or in glades; some were in chalk grassland or scrub. The type of woodland, or nearest associated trees, comprised beech (especially), chestnut, yew, whitebeam, ash coppice, hazel coppice, hornbeam and hawthorn scrub. As regards associates other than trees, Francis Rose mentions[496] *Daphne laureola* (Spurge-laurel), *Mercurialis perennis* (Dog's Mercury), *Sanicula europaea* (Sanicle) and various orchid species. He considered[497] that the Lady Orchid grows mainly in two types of habitat: in dense chalk scrub or coppice, supplying shelter and moderate light; and in the lower edges of escarpment beechwoods, where it usually grows on the terraces formed by the trees' surface roots or else on the crests of chalky banks in these woods, but may often occur just outside woods.

Gorsley. Photo by Sue Buckingham, 2022

However, as it seems more at home in scrub than in beechwood, less scattered and flowering more freely, and does not flourish on open downs, he speculated that the native origins of the species may lie before the post-glacial arrival of beech in Britain. In consequence of this habitat preference, Gay (2013)[498] suggests that *Orchis purpurea* colonies may fluctuate (although seldom disappearing completely) as woodland is coppiced and then allowed to mature; so that the most suitable woodlands are probably those with a high degree of structural diversity, with some open grassland and with scrub.

Orchis purpurea is a distinctive orchid with unspotted leaves, often tall and robust, with flowers whose sepals form a brownish-purple hood (hence the former name of Brown-winged Orchid), below which the wide labellum, with arm-like side lobes, is usually whitish or pink-flushed with dotted red papillae, giving the impression of a bonneted Victorian lady in a spotted dress. There is, however, much variation in appearance, and Francis Rose thought that there were two geographical types, divided by the Stour Valley between Ashford and Canterbury. The western type was supposed generally to be less tall, with a shorter and denser inflorescence, a shorter ovary (≤1.9cm), the red labellum spots more prominent and anthocyanin pigments rose to purple (rather than salmon to brownish-red).

Molecular analysis does not yet fully support genetic differentiation of such variants, but the position is far from straightforward, and is bound up with the close relationship between *Orchis purpurea*, *Orchis simia* (Monkey Orchid – present in Kent, but very rare) and *Orchis militaris* (Military Orchid – formerly present in

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[496] Rose, F. (1994), Orchis purpurea Hudson, Lady orchid, in (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC.

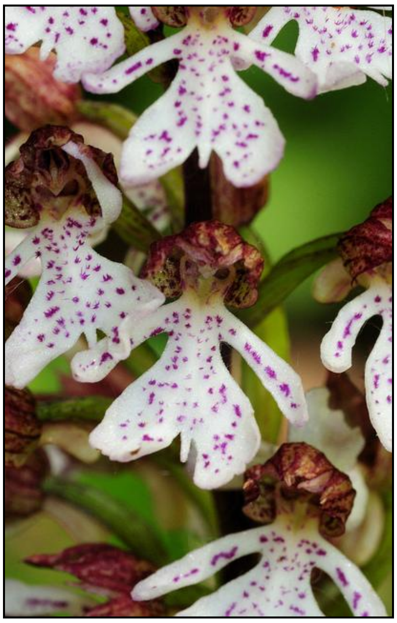
[497] Rose, F. (1948), as above.

[498] Gay, A. (2013). Further Notes on *Orchis purpurea* Herbivory and Conservation. *Journal of the Hardy Orchid Society* **10(1)**: 12-16.

Kent). *O. militaris* and *O. simia*, from genetic analysis appear to be well-defined species, but the situation with *O. purpurea* is not so clear. With ITS (internal transcribed spacer) and with AFLP (amplified fragment length polymorphism) analysis, there is a suggestion that this species as currently circumscribed includes two genetic entities: many English populations always believed to be *O. purpurea* contain individuals with the ITS type normally associated with *O. militaris*, a genetic signature also associated with some French populations and possibly obtaining elsewhere in Europe[499].

A study of *purpurea*/*simia* hybrids at Goring, Oxfordshire[500] indicated that *O. purpurea* from Stockbury Hill Wood (East Kent, but in Francis Rose's western group) differed genetically from other Kent samples (including from Covet Wood, in Francis Rose's eastern group, which showed differences in floral shape, orientation and colour). The possibility that genetic traces of *O. militaris*, despite its disappearance from the county, still remain in some *O. purpurea* populations here, through past hybridisation and introgression, is also suggested by resemblances to *O. militaris* in plants encountered from time to time. This is dealt with more fully in David Johnson's *Wild Orchids of Kent* (2019). The introgression, if that is what it is, is shown particularly by plants having smaller flowers in which the divisions of the labellum are narrower than usual *O. purpurea,* so as to exhibit an especially slim 'lady' appearing very much like the 'soldier' of *O. militaris*, although hooded sepals retain the appearance of the lady's bonnet rather than the military helmet. C.G. Druce described[501] such a form as var. *pseudo-militaris*, remarking that it had been the cause of a number of mistaken identifications of *O. militaris*. Various observers have since seen plants with similar characteristics, both east and west of the Stour.

Ignoring the shape of the labellum, normally one can separate *O. purpurea* from *O. militaris* (and *O. simia*) by the outer perianths-segments of the *O. purpurea* 'bonnet' being much darker than the labellum (paler, in the other species) and short-pointed oval in shape (long-pointed oval-lanceolate in the other species).



Yockletts Bank. Photo by Lliam Rooney, 21 May 2009

While its Kent populations seem broadly stable, the main threat appears to be grazing. Francis Rose in his 1948 account recognized rabbit nibbling as serious, with most or all spikes in many localities eaten or smashed off by late May / early June, damage being worst in open habitats. There would presumably have been some respite after the introduction of myxomatosis, but rabbits have come back since and continue to cause damage. Deer have potential to be the greater problem now, with deer populations in the UK in largely wooded landscapes being perhaps at their highest level since human agricultural activities began to affect the landscape, bringing consequential effects on woodland understory; but Alfred Gay (personal communication) considers that their threat to *Orchis purpurea* is not substantiated. The orchid is primarily a plant of East Kent, and deer populations seem more substantial in West Kent[502] – whether of Roe, Fallow, Sika or Reeve's Muntjac (Red Deer do not appear to have a significant presence in Kent). Fallow deer are present in low density at Denge Wood (Bonsai Bank) where the very large *Orchis purpurea* colony has been flowering untouched. Fallow are also present at very high density at Cutler's Wood near Challock, creating a noticeable browse line, initially thought to be without a corresponding effect on *Orchis purpurea* colony there, but in 2021 after a dry April, it was decimated. Near total browsing of a large *Orchis purpurea* colony in East Kent each year from 2007 to 2012 has led to speculation as regards the identity of the herbivore concerned, although with rabbits being more likely than deer. Gay (2013)[503] points out that a particular type of damage observed at this site, with individual florets nipped off, rather than whole stems, suggests the actions of birds or invertebrates; and the most likely cause may be the rearing and feeding of pheasants in the near vicinity, although slugs and snails are not ruled out.

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[499] Fay, M.F., Smith, R.J., Zuiderduin,K., Hooper, E., Samuel, R., Bateman, R.M. & Chase, M.W. (2007). How does hybridization influence the decision making process in conservation? The genus *Orchis* (Orchidaceae) as a case history. *Lankesteriana* 7(1-2): 135-137.

[500] Bateman, R.M., Smith, R.J. & Fay, M.J. (2008). Morphometric and population genetic analyses elucidate the origin, evolutionary significance and conservation implications of *Orchis* × *angusticruris* (*O. purpurea* × *O. simia*), a hybrid orchid new to Britain. *Botanical Journal of the Linnean Society*, **157**: 687–711.

[501] Druce, C.G. (1928). ORCHIS PURPUREA Huds., nov. Var. PSEUDO-MILITARIS, Plant Notes, etc, for 1927. *B.E.C. report* for 1927.

[502] Distribution given in Thompson, S., Newcombe, M. & Puckett, J. (2015). *Mammals of Kent*, Broadstairs.

In 2020, the Kent Botanical Recording Group began survey and study of known populations for the purposes of assessing what might serve the purposes of its Kent Biodiversity Strategy status. The initial report is given in the KBRG October 2020 newsletter (http://www.bsbi.org.uk/kent), and this was followed up in the 2021, 2022 2023 and 2024 issues, all with valuable observations aeising from the surveys. Factors affecting the wellbeing of colonies were assessed, with predation by slugs, rabbits and fallow deer noted. Summary data are as follows:

Lady Orchid counts

Tetrad	**Site**	**Number of plants 2020**	**Number of plants 2021**	**Number of plants 2022**	**Number of plants 2023**	**Number of plants 2024**	**recorded highest counts 1970-2019**
TQ46Q	Rushmore Hill	0					Last records 1991 & 1987-99
TQ55R	Bitchet Common-One Tree Hill			0			single plant 2012
TQ56F	Otford-Greenhill Wood			12 flowering + 3 blind			10 plants in 2016
TQ66L	Culverstone Green/Harvel				0		10 plants in 2020
TQ66T	Henley Street-Cobhambury Wood			0			2 plants 2015
TQ66W	Upper Halling				15 flowering + 60 blind	76 flowering + 20 blind	15 flowering, 10 blind in 2010
TQ66X	Upper Halling				0 but site suitable	0	1 by footpath in 2013
TQ66X	North Halling				1 Flowering ??, site suitable		1 by footpath in 2010
TQ66X	Holborough Woodlands					2 flowering	NEW SITE
TQ66Y	Luddesdown					0	3 under pylons (2015)
TQ66Y	Red Wood west			6 flowering + 1 blind		3 flowering + 4 blind	new site
TQ66Y	Red Wood east			0			1 plant 2010 - habitat changed
TQ76D	Ranscombe west	38 flowering + 21 blind	58 flowering + 67 blind	60 flowering + 49 blind	56 flowering + 58 blind	31 flowering + 62 blind	71 flowering in 2013
TQ76E	Great Wood	11 flowering	8 flowering + 7 blind	11 + 3 blind	6 flowering + 16 blind	2 flowering	17 in 2016
TQ76E	Clay Pond Wood		7 flowering + 10 blind	9 + 1 blind	7 flowering + 5 blind	9 flowering + 1 blind	13 flowering (2013)
TQ76G	Burham Downs	168 flowering + 139 blind	late visit: 5 swollen capsules		36 plants	110 flowering +229 blind	285 (2013)

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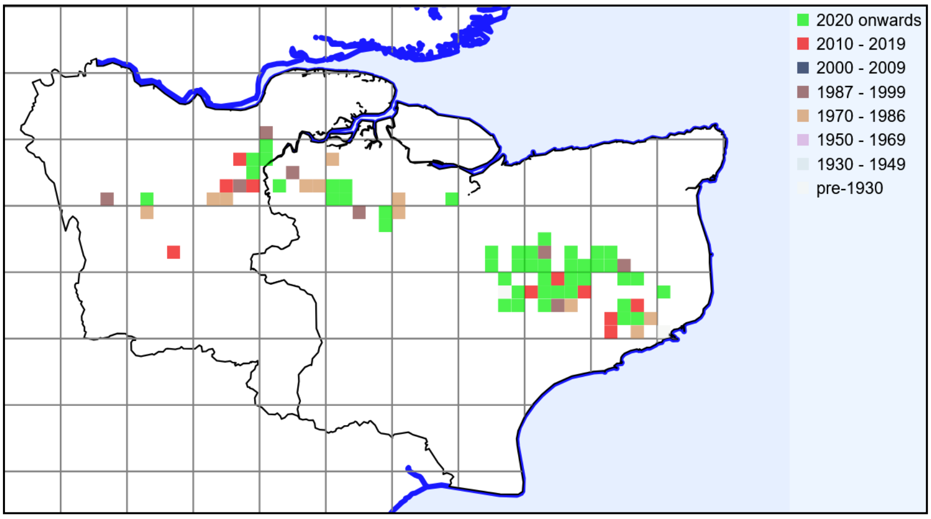
[503] Gay, A. (2013), as above.

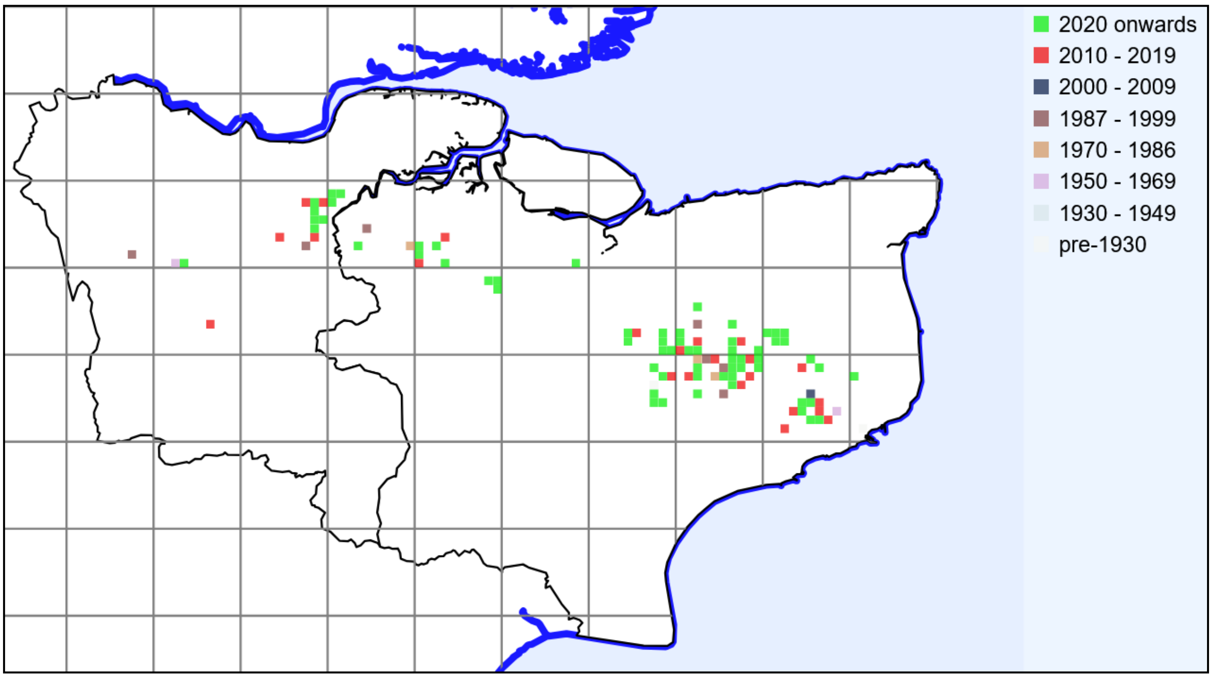
TQ77A	Great Crabbles Wood			0		0	first record Merrett (1666), last 1997
TQ85Y	Frinsted, Stock Wood			1 flowering + 3 blind		10 flowering + 27 blind	2 plants in 2004
TQ86A	Bredhurst Woods		1 flowering, at 2 locations			0	50 spikes recorded in 2011
TQ66B	Kemsley Street					172 flowering + 261 blind	12 flowering 2015
TQ86F	Stockbury Hill		105 flowering + 16 blind				299 in 2019
TQ86G	Queendown Warren		2 flowering + 1 blind			2 flowering + 2 blind	few records
TQ96V	Ospringe		10 flowering + 24 blind	19 flowering + 32 blind	5 flowering + 50 blind	6 flowering + 30 blind	35 flowering (2013)
TR04	Wye Downs		34 flowering	32 flowering	30 flowering +28 blind	21 flowering	34 flowering
TR04U	Warren Wood east	18 flowering + 10 blind		36 flowering + 20 blind			Small colony
TR04U	Warren Wood west	4 flowering + 10 blind		9 flowering + 6 blind			Scattered colonies
TR04Y	Towns Wood				1 flowering		New record
TR05K	Cutlers Wood		20 flowering + 300-500 blind or bitten		1 flowering plant >100 non-flowering	21 flowering	Estimated 300 flowering (KBRG 2016)
TR05L	Park Wood	1 flowering	1 flowering		2 flowering + 2 blind	6 flowering + 8 blind	
TR05V	Down Wood		6 flowering + 7 blind				10 flowering in 2010
TR05V	Eggringe Wood		7 flowering				3 flowering, 2 blind (2014)
TR05V	Thruxted		6 flowering				15 flowering (2011)
TR14H	Spong Wood	7 flowering				4 flowering + 15 blind	
TR14H	Little Profit (private)		90 flowering (estimate)				estimate 90 flowering
TR14I	Yockletts Bank	320 flowering + >100 blind	376 flowering	548 flowering	243 flowering, few blind	150 flowering (estimate).	505 flowering 2013
TR14J	Dunlies					0	A 1975 record
TR14T	Parkgate Down		1 flowering	1 flowering		1 flowering	
TR14T	Elhampark Wood		1 flowering				
TR14U	Palmstead	54 flowering + 9 blind	35 flowering by KWT RNR			154 flowering + 86 blind	25 flowering 2011
TR14U	Covet Wood	361 flowering	124 flowering + approx 70 blind	213 flowering + 60 blind	64 flowering + ±60 blind		Up to 3,000 in 1990s
TR14U	Quilters Wood		2 flowering, probably more		10 flowering + >30 blind		
TR14Z	Jumping Down		3 flowering + 5 blind		None flowering, 19	4 flowering	5 plants (2013)

					blind		
TR14Z	Long Ruffet Wood		40 flowering + 80 blind				24 flowering (2011)
TR15A	Bonsai Bank	1550 flowering + > 2,000 blind	1224 flowering + >2,000 blind	2,066 flowering	1322 flowering	1400 flowering (estimate)	3,481 (2013)
TR15A	Dunstans Wood				2 flowering + 1 blind		4 plants in 2015
TR15B	Denge Wood (Woodland Trust)	34 flowering + >20 blind					
TR15F	Earley Wood					8 flowering + 4 blind	
TR15H	Larkey Valley		32 flowering + 3 blind		3 flowering + 5 blind	31 Flowering, 50 Blind	29 flowering (2013)
TR15Q	Gorsley Wood west			3 flowering + 3 blind			2 in 2018
TR15Q	Gorsley Wood garden population.			at least 300 flowering	930 flowering		known as game-keeper’s cottage
TR15Q	Bursted Wood			5 flowering			remains of plants seen 2011
TR15R	Whitehill Wood	4 flowering + 10 blind					8 flowering (2011)
TR15V	Knowle Wood		13 flowering + 20 blind		70 flowering + 17 blind		12 (2011)
TR24F	Reinden Wood				0		A single clump with 3 spikes 2013
TR24L	Sladden Wood		1 flowering and 2 blind	2 flowering + 1 blind			
TR24M	Cannon (& Lyoak) Woods	33 flowering + 17 blind	53 flowering	68 flowering + 66 blind	38 flowering + 110 blind	18 flowering, 98 blind	400 flowering (2003)
TR24P	Stafflands Wood					1 flowering	A 1948 record
TR24R	Gorsehill Wood			0			2 in 2013
TR24U	Golgotha				1	1 blind	No previous records for tetrad
TR25A	Ileden Wood		3 blind	2 flowering + 1 blind	4 plants	2 flowering + 3 blind	1 in 2013
TR25B	Woodlands, Pitt and Well Woods	33 flowering + 15 blind	36 flowering + 160 blind	124 flowering + 81 blind	32 flowering + 159 blind	85 flowering + 112 blind	133 flowering (2012)
TR25F	Spinney Wood					1 blind	
TR24D	Eastling Wood				1 flowering (from road)	1 flowering	
		TOTAL flowering: 2,636 TOTAL non-flowering: 2,351	TOTAL flowering - 2,243 TOTAL non-flowering - 3,473	TOTAL flowering 3,529 Total non-flowering – not known	Total flowering 2,879 Total non-flowering – not known	Total flowering 2,315 Total non-flowering - 1024 counted	

The data assembled 2020-24 is more comprehensive than has been achieved in the county at any other time and may be viewed in conjunction with distribution as mapped below. Tetrad mapping shows best the coverage where earlier records have not been seen recently (tetrads being the standard recording unit from 1970 to 2010); and monad mapping displays more accurately recent recording (monads being the standard recording unit from 2010). It is noticeable how the core distribution has remained fairly constant in East Kent from the Stour valley eastwards to Alkham and Aylsham, although the survey data above indicate a wide range of colony size, including variation year on year.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Orchis purpurea **Kent records to 2024 mapped at tetrad level, from BSBI database.**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Orchis purpurea **Kent records to 2024 mapped at monad level, from BSBI database.**

Orchis simia Lam. (Monkey Orchid)

vc 15; long gone from vc16

Rarity / scarcity status

Orchis simia is in Britain restricted to sites on the chalk in Kent and Oxfordshire (the latter holding c.93% of the overall population) and is regarded as **Vulnerable** to the risk of extinction. It is **nationally rare** and protected from sale, picking and uprooting under Schedule 8 of the Wildlife and Countryside Act 1981. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. Stroh *et al.* (2014)[504] gave an estimate of 372 plants in England, based on a ten-year mean (2003-13), from which were excluded plants deriving from a Kent site to which the species had been introduced. There is one native site in the county, and another to which the species was introduced; so the Kent status of *Orchis simia* is very **rare**.

Park Gate Down. Photo by David Steere, 10 May 2014

Account

While all early records require some interpretation because of the close relationship between *Orchis simia* and *Orchis militaris* (both treated under the same name by Linnaeus), Monkey Orchid was first recorded in Kent by Edward Jacob in his *Plantae Favershamienses* (1777) '*On chalky bushy Banks beyond* Whitehill, Ospringe – *not common*'. Whitehill is a hamlet south of Ospringe and, as Jacob was writing about plants of Faversham presumably 'beyond' implies further away from Faversham and hence south or south west of Whitehill, perhaps TQ9958 or TR0058, just under 2.5km from the present native site. There is another early record, published in 1802 by Lewis Dillwyn as *O. militaris* 'near Chilton, on the side of the path leading from Bushy Rough to Alkham' (presumably TR2743)[505]. Otherwise, there are several early nineteenth century records in north west Kent: at Stonewood near Bean, Lullingstone, Maplescombe, Eynsford (may be the same as either of the last two), and near Dartford. These seem to have suffered the same fate as most populations in the Thames valley between Marlow and Wallingford, where it was common until the 1840s, afterwards disappearing except for one Oxfordshire colony.

By the time of the Flora of Kent (Hanbury & Marshall, 1899) it was noted as a plant of wood borders and rough bushy banks on the chalk, but very rare, perhaps extinct. It made an appearance at Charlton Park, Bishopsbourne in very rough, coarse grass on a chalk slope, four or five plants growing with *Anacamptis morio* (Green-winged Orchid) and *Orchis anthropophora* (Man Orchid), but only until 1923. No more than two plants flowered at any one time, and at least four were picked, which would not have assisted continuity. Jocelyn Brooke[506] considered that the plants differed from Oxfordshire *O. simia*, in lip shape, colour and other features, approaching (but not identical to) the normal Continental type. A possible sighting at Burham Down c. 1930 went unconfirmed. Then the last West Kent find was made, at Shoreham Road, Otford, well south of the older records: in 1952 a solitary spike was found on a disused tennis court, then rough chalk grassland, at the vicarage. Upon the Rev. A.E. Elder's retirement, the plant with two seedlings was moved to a 'safe' place, at Dunstall Woods, where it produced a fine flower spike in 1957, but there is no subsequent record.

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[504] Stroh, P.A. et Al. (2014). A Vascular Plant Red List for England. Botanical Society of Britain and Ireland, Bristol.

[505] Dillwyn, L.W. (1802). Catalogue of the more rare Plants found in the Environs of Dover, with occasional Remarks. *Transactions of the Linnean Society* **6:** 177-184

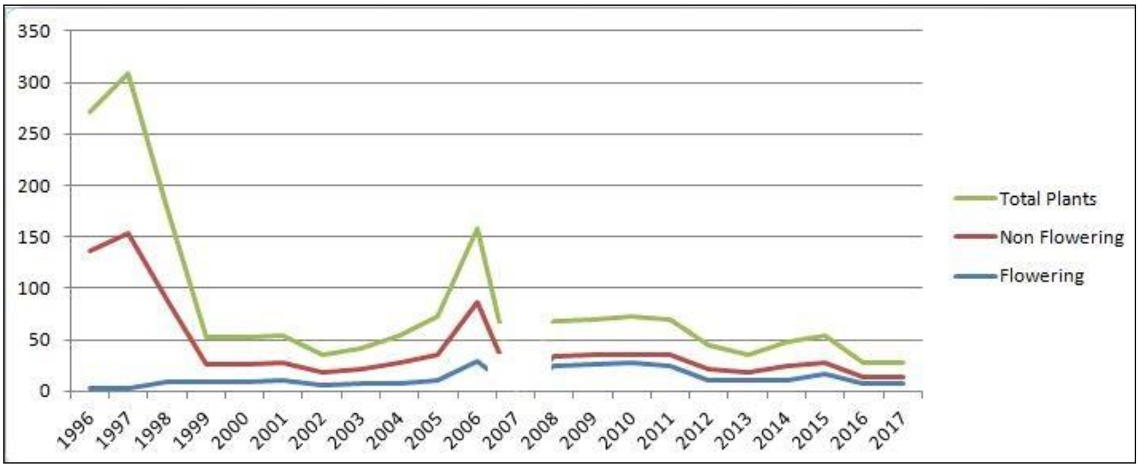
[506] Brooke, B.J. (1938). Notes on the occurrence of Orchis simia Lamarck in Kent, *Journal of Botany* **76**: 337-341

Park Gate Down. Photo by Lliam Rooney, 28 May 2009

The present status of *Orchis simia* in Kent derives from its rediscovery in 1955 by Hector Wilks near Putt Wood, Ospringe, not far from Edward Jacob's 1777 published record. He found a single flower in full bloom on a rough chalk down with a south easterly aspect, but also open to the south and south west, the soil being very shallow humus over almost pure weathered chalk. Although sheltered from the north by a tuft of *Bromopsis erecta* (Upright Brome), the plant did not survive to set seed, perhaps being predated by a slug. The next year, the same plant flowered, in company with four more plants, but all failed to set seed. In subsequent years, numbers increased, and plants spread into the adjoining woodland, as far as 25ft in, growing in fairly deep shade, which appeared to affect their prospects of flowering. The colony achieved 220[507] inflorescences by 1965; and from 1958 the poor rate of seed set, even in open conditions, was addressed by hand pollination, although this still did not always result in good seed set. Some seed was allowed to fall in situ, with sowings also made in six selected places elsewhere in Kent.[508]

One of these was the KWT Park Gate Down reserve, and by this means a second Kent population has been established, albeit introduced. The 1958 sowing resulted in a first appearance of three flower spikes in 1965, increasing to nine (1979), 14 (1980), 23 (1984), 36 (1988), 59 (1990), 44 (1995), 100 (1999) and at least 550 in 2013. There are fluctuations, however.

The original colony at Ospringe is managed, although not publically accessible as is the Park Gate Down reserve, but the overall number of plants dropped significantly towards the end of the 1990s. The chart below shows this, and a level of fluctuation since (the interruption in 2007 is due to the absence of data), but still an overall downward trend, from 26 plants (including 9 flowering) in both 1999 and 2000, thence to 14 in both 2016 and 2017 (of which 8 and 7 were flowering in those respective years).



***Orchis simia* counts at Ospringe, from data supplied by Kent Wildlife Trust**

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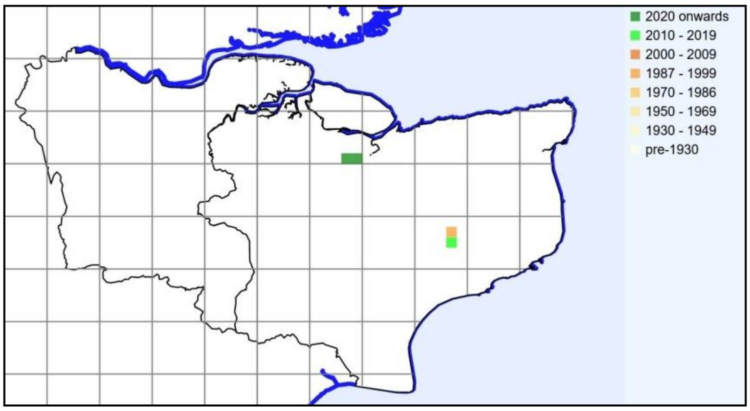
[507] 220 plants, according to Francis Rose's manuscript Flora; another source says 205.

[508] The history of discovery and conservation measures undertaken is set out in Johnson, D. (2023). Hector Wilks and the Monkey Orchid (*Orchis simia*). *Transactions of the Kent Field Club* **22**: 34-48.

In May 2021 the site was found to hold 116 plants, of which 31 were flowering or in bud (only 20 flowered in 2020); in May 2022 the total was 97. KWT apparently relinquished management and all plants were caged preparatory to scrub clearance scheduled for winter 2021-22.



Orchis simia **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Accordingly, the Park Gate Down reserve holds larger numbers by far. This offers some potential for further spread: a single flowering plant was found at a nearby site in 1993, thereafter reverting to a vegetative state.

Ospringe, habitat. Photo by David Steere, 14 May 2016

The overall picture of *Orchis simia* occurrences, historic and recent, appears to be in general sporadic, except perhaps for the early nineteenth century cluster of records for north west Kent and even for those there is no evidence of sustained populations. This would be consistent with random introductions by seed blown over from the Continent, limited only by the need for chalk habitat and mycorrhizal presence. Even the native Ospringe colony could well have been such a random introduction, in spite of the nearby 1777 record, given the absence of any evidence of continuity.

Material from Ospringe and from a relict population at Goring, Oxfordshire, was studied[509] in the 1980s to test the hypothesis that relict and recent populations would show effects of differences in their origins and/or periods elapsed since founding. Although there appeared to be some morphological differences between the populations – the Goring plants were overall shorter, less robust with narrower stems, and fewer, smaller basal leaves – the population differences did not enable individual plants to be distinguished. However, the greater mean vegetative vigour and anthocyanin content of the Ospringe population compared with Goring gave some support to the hypothesis that it originated from similar Continental populations. Surprisingly, both colonies showed fairly similar levels of intra-population variation in their vegetative characters. One would have expected the Goring population to show the greater variation of a diverse and stable gene pool deriving from an originally extensive population with a long recorded history; and the Ospringe population, if recently founded, should for the first few generations show low genetic diversity. While there were other possible explanations, including the Ospringe population being established earlier than supposed, the probability was that the Ospringe population had been founded relatively recently (although before c. 1945), but there had been a loss of genetic diversity in the Goring population as a result of its re-establishment from a few individuals after being ploughed up in 1949 and 1950.

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[509] Bateman, R.M. & Farrington, O.S. (1989) Morphometric comparison of populations of *Orchis simia* Lam. (Orchidaceae) from Oxfordshire and Kent. *Botanical Journal of the Linnean Society* **100:** 205-218.

Although the Ospringe plants required initial hand-pollination, and this applied also to the Park Gate colony in its early stages, it appears from the latter's development as though there may be a 'critical mass' for an improvement in a population's rate of natural seed set to arise, as the number and density of plants presents a greater attraction to pollinators. Evidently *Orchis simia* shares a pollinator in common with *Orchis anthropophora* (Man Orchid), for their hybrid to have arisen on more than one occasion at Ospringe (see the account for *Orchis anthropophora*).

Park Gate Down, habitat. Photo by Lliam Rooney, 7 June 2010

It is a distinctive orchid, and confusion is only likely to arise with the closely related species *Orchis purpurea* and *Orchis militaris* (extinct in Kent). It is, however, a smaller and more slender plant than *Orchis purpurea,* whose labellum lacks the very thin arm and leg lobes of the *Orchis simia* 'monkey'. *Orchis militaris* is closer in appearance, but the leg lobes are broader and diverge widely.

Kent Rare Plant Register
Species accounts Part Ore-Ox

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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The register formerly included the following species account which may now be found at **Appendix A** of the register, https://bsbi.org/kent

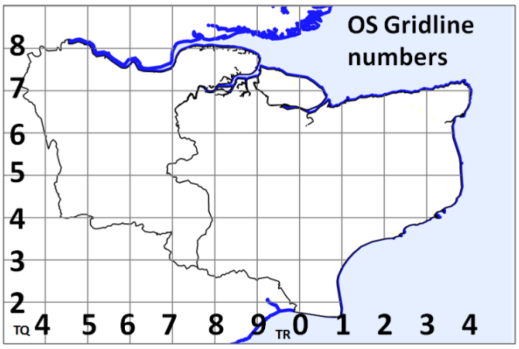
***Orobanche hederae* (Ivy Broomrape)**

Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AC Andrew Craven
AG Alfred Gay
AL Alex Lockton
AW Tony Witts
BS Bob Smith
CHo Claire Horder
CJ Clive Jermy
CJC & AP James Cadbury & A. Parker
CO Colin Osborne
DC Daniel Colborne
DM Daphne Mills
DS David Steere
EGP Eric Philp
FR Francis Rose
GK Geoffrey Kitchener
GT Gill Tysoe
HP Mrs H. Pollard
IB Ian Beavis
JH Jan Hendey
JHo John Horder
JM JasonMoule
JP Joyce Pitt
JPu John Puckett
JRP John Palmer
JS Judith Shorter
JW Jo Weightman
KBRG Kent Botanical Recording Group
KR K.D. Rowlands
KS Keith Stewkesbury
LF Lynne Farrell
LH & DH Lorna & Derek Holland
LM Lesley Mason
LNHS London Natural History Society
LR Lliam Rooney
MC Mick Crawley
MF Mary Fuller
MJ M. Jones
MP Mary Page
ND Nick Delaney
NG Nick Green
NJ Nick Johansson
OL Owen Leyshon
PC P.D. Carey
PG Phil Green
PH Paul Holt
PS Philip Sansum
RC Ray Clarke
RF Rosemary FitzGerald
RHW R.H. Woodall
RM Richard Moyse
RMB Rodney Burton
SB Sue Buckingham
SC Steve Coates
SH Stuart Headley
SL Stephen Lemon
SP Sian Pettman
ST Samuel Thomas
TL Trevor Lording
TM T. Miller
TS T. Swandale
WEC Wally Coultrop

Other abbreviations and references:

BM =Natural History Museum herbarium	Hanbury & Marshall (1899) refers to their *Flora of Kent*	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BPS = British Pteridological Society	KWT = Kent Wildlife Trust	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MNE = Maidstone Museum herbarium	

Oreopteris limbosperma All. Holub (Lemon-scented Fern)

vc 15 and16

Rarity / scarcity status

Lemon-scented Fern is fairly common in damp shady places in north and west Britain, although with a limited Irish distribution. It is largely absent from central and eastern England, and in the south east it is little found outside acid wooded areas of Sussex, Surrey and Hampshire. Its conservation risk status in England and in Great Britain as a whole is of 'Least Concern'; but in Kent it appears to be declining and is **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Kilndown Wood. Photo by Stephen Lemon, 12 August 2017

Account

The first published record for Kent is likely to be Thomas Forster's reference in his *Flora Tonbrigensis* (1816) to the fern being 'On heaths and sides of ditches; very common among the rocks and ditches all round the Wells, and elsewhere: the smell of the leaves when touched is very fragrant'. Forster's Flora was subtitled *A Catalogue of plants growing wild in the neighbourhood of Tonbridge Wells*, and a plant attributed to the Wells was as likely to be in what is now botanical Sussex as Kent; but the entry for the fern certainly seems to include Kent, although Hanbury & Marshall (1899) observe that most of the stations in this neighbourhood appear to be in Sussex. They also comment on it being a rare plant of heaths and give only a few records, with a concentration in West Kent from the Greensand Ridge (Bayley's Hill) south to Rustall Common.

Bedgebury pinetum. Photo by Stephen Lemon, 28 August 2017

Francis Rose in his manuscript Flora described it as a plant of damp heathy woodland rides on acid soils, and in boggy hollows in woods, frequent locally in the High Weald. In revising the Flora he truncated reference to the High Weald sites which in the original manuscript were as follows (with details added in square brackets from specimens at **MNE**):

'Redleaf Wood, Penshurst [damp ground at foot of sandstone rocks]; Ferndale, Tun. Wells, CAS; Hayes Wood, Pembury [boggy woodland valley]; Furnace Pond, Horsmonden [in boggy wood]; N. of Lamberhurst Quarter [woodland ride]; Furnace Wood [Lamberhurst, damp loamy ride]; Gt Sandhurst Wood [by ride on sandy loam]; E. side Bayham Woods; N.E. of Kippings Cross; Kilndown Wood [damp sandy loam of woodland ride on Tunbridge Wells Sand]; Combwell Wood, abundant [In Sphagnum bog in wood on Tunbridge Wells Sand]; Bedgebury Pinetum [boggy woodland ditch-sides]; Bedgebury Forest; Angley Wood [fresh-cut chestnut coppice on acid sandy loam]; Old Park Wood [by damp sandy ride]; Sissinghurst Park Wood [boggy hollow in woodland ride on Tunbridge Wells Sand]'. In contrast, there were relatively few records elsewhere: a sprinkling along wetter parts of the West Kent Folkestone Formation extending to the chartlands over the Hythe Formation; Parson’s Marsh (a singleton on damp bank of track on Hythe Beds drift); Scord’s Wood, Brasted; Seal Chart (boggy wooded valley in SW corner); and Ightham Common (shady pond bank). There were outliers at Joyden’s Wood (a singleton in a damp sandy wood); Ryarsh Wood (very rare); Knockheath east of Tenterden (an acid boggy wood); Cole Wood, Woodchurch; and Willesborough Lees where it was present by a peaty ditch or steamlet across bog remnants from 1944 to 1955, where seen by G.E. Smith in 1829[510].

Those outliers were, except for Cole Wood, missing from Philp (1982) which otherwise captures well for 1971-80 the concentration in the High Weald and the sprinkling in the Westerham / Brasted / Ide Hill chartlands. There were, however, new outliers in TR14 (north of Lyminge in East Kent) which are surprising, and which may represent isolated occurrences on acid superficial soils in plateau woodlands: otherwise the geology appears inappropriate and wet habitats limited. Notwithstanding the 23 tetrads recorded in Philp (1982), the total dropped to eight tetrads in Philp (2010). Although a special effort had been made to record this species, it appeared then to be missing from a number of former localities: even if overlooked at some of them, it was considered that there had been a serious decline, without a cause being identified. There do not seem to be any general habitat changes in the intervening period which can have affected occurrence. The species is, however, growing in Kent at the edge of its UK range, away from its wetter heartlands in the north and west. That marginality is emphasised by the relative absence of records in France until one comes to the Alps and Pyrenees. It may be that the species in Kent is disproportionately affected by any significant period of reduction in rainfall.

The 2010-24 records amount to 13 tetrads (17 monads) and to a degree are consistent with the decline shown by Philp (2010), and the apparent retreat to the High Weald, although not as drastic as Philp (2010) suggests. Lost’ records from the 1970s are particularly noticeable from the west Kent chartlands in the tetrad distribution map below, leaving presence mostly in the Kilndown/Bewl/Scotney area.

***Oreopteris limbosperma* Kent records to 2024 mapped at tetrad level, from BSBI database.**

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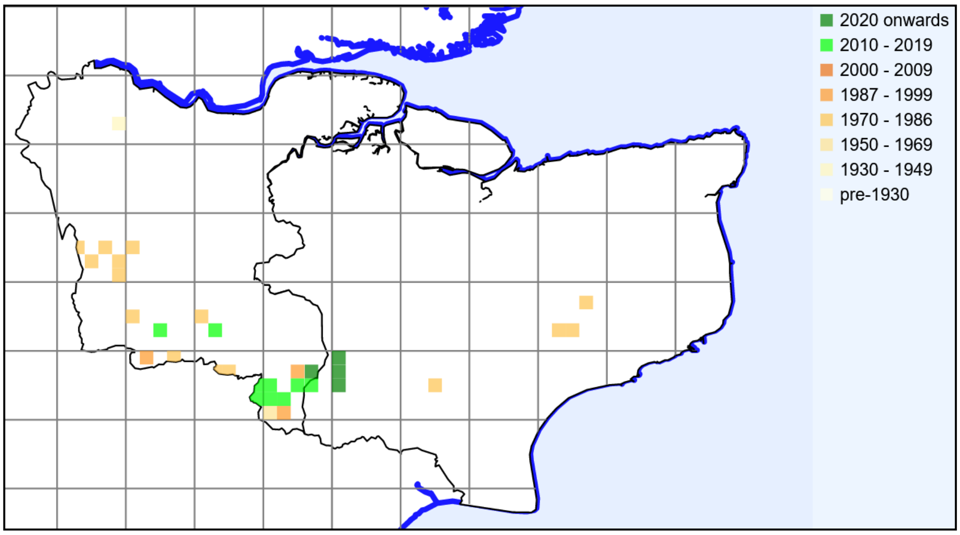

Where found in the 1990s/2000s, it was in acidic or humus-rich soils in open woodland, alongside drainage ditches and on streamsides. Habitat-related data from post-2010 records show the fern being found in acid woodland, especially on the Tunbridge Wells Sand Formation, on banks or by ditches alongside paths or rides. The banks and ditches presumably provide a degree of water movement around the roots. Where it is seen spread out alongside tracks, it may be that there is a need for balance between conditions which provide a degree of light, or at any rate light shade, but not so open as to encourage excessive ground cover competition.

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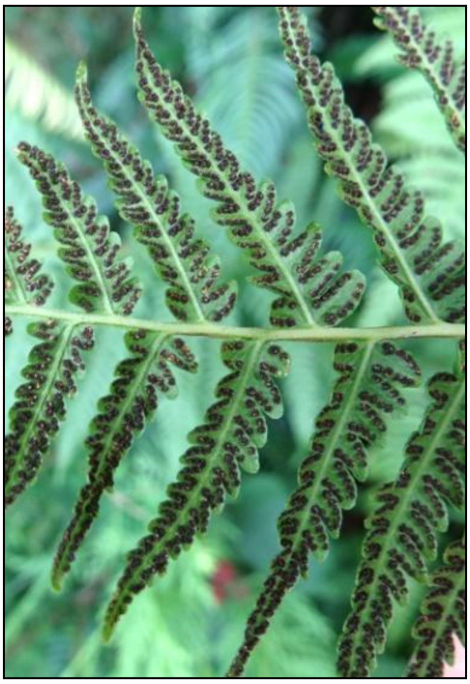
[510] Smith, G.E. (1829), A Catalogue of rare or remarkable phaenogamous plants collected in south Kent. The location was opened up again by tree felling in 2014, but the fern was not seen here when searched for, in 2018, here and in wet woodland to the west.

Chingley Wood, habitat. Photo by Stephen Lemon, 13 August 2017

Lemon-scented fern may be overlooked for *Dryopteris filix-mas* (Male-fern) but below the middle of the frond, the pinnae taper gradually to the base. The pinna segments (the smallest divisions of the frond) may turn downwards at the margins, protecting the sori which line the margins underneath, instead of being held centrally as with *Dryopteris filix-mas.* The fern's lemon scent comes, if the frond is lightly brushed, from minute glands on the frond underside.



Bedgebury pinetum, frond showing sori on underside. . Photo by Stephen Lemon, 28 August 2017

Site	Grid reference	Site status	Last record date	Recorder	Comments
North west of Westerham	TQ45H		After 1970, before 1981	Philp (1982)	[Half of this tetrad is in Surrey.]
Hosey Hill area	TQ45L		(1) 1981 (2) After 1970, before 1981	(1) RC (2) Philp (1982)	
Brasted	TQ45S		After 1970, before 1981	Philp (1982)	
Ide Hill area	TQ45V		After 1970, before 1981	Philp (1982)	
Stone Cross	TQ53J		(1) 10 July 1994 (2)After 1990, before 1999	(1) EGP (2) Philp (1982)	(1) Newpark Wood, specimen in **MNE**. (2) -
Rusthall Common	TQ53U		After 1970, before 1981	EGP, WEC & MP in Philp (1982)	
Tunbridge Wells	TQ5739		July 1974	WEC	
Between Chiddingstone and Penshurst	TQ54C		After 1970, before 1981	Philp (1982)	
Ashour Wood	TQ5443		11 March 2017	SL	Open area of track in chestnut/conifer dominated woodland, on slope west of ghyll stream, TQ 5457 4379. Dead fronds of two plants on track, 3rd plant above these at side of track, with dead fronds of Bracken and Lady Fern.
West Sevenoaks	TQ55C		After 1970, before	Philp (1982)	

			1981		
North of Little Bayham area	TQ63I		After 1970, before 1981	Philp (1982)	[Probably Furnace Wood area; most of the tetrad is otherwise in Sussex.]
Bayham –Stubbs Wood	TQ6537		6 September 1990	FR	On ride.
Bayham Abbey area	TQ63N		After 1970, before 1981	Philp (1982)	
Pembury Walks	TQ6142	RSPB reserve	9 August 2012	JP & JH	TQ 619 424.
Pembury Walks	TQ6242		(1) 9 August 2012 (2) After 1970, before 1981	(1) JP (2) Philp (1982)	(1) - (2) Given as TQ64G, so may relate to an adjoining monad.
Bewl, Chingley Wood (west)	TQ6833		(1) 11 August 2018 (2) 13 August 2017 (3) 2 August 2012 (4) 4 June 2001 (5) 6 September 1990	(1) KBRG/KFC meeting (2) SL (3) JP (4) EGP (5) FR	(1) Chingley Wood. (2) Chingley Wood, north facing edge of Sweet Chestnut coppice along a former ride, recently re-landscaped into a much wider open area, TQ 688 337 to TQ 689 337. Numerous plants along north facing edge with small area dominated by them within open clearance. (3) Throughout Chingley Wood, TQ 682 377. (4) Given as TQ63W, so may belong in adjoining monad. (5) Locally frequent.
Bewl, Chingley Wood (east)	TQ6933		(1) 13 August 2017 (2) 2 August 2012	(1) SL (2) JP	(1) Chingley Wood, north facing edge of Sweet Chestnut coppice along a former ride, recently re-landscaped into a much wider open area, smaller rising track off this to the south, TQ 690 337 to TQ6 91 337. Abundant plants all along north facing edge, scattered plants within open cleared area, abundant plants lining narrow track. (2) Throughout Chingley Wood.
Kilndown (south west)	TQ6934		(1) 11 August 2018 (2) 2 September 201 (3) After 1970, before 1981	(1) KBRG/KFC meeting (2) JP (3) Philp (1982)	(1) Chingley Wood path side at TQ 6909 3406. (2) Kilndown Wood. (3) Given as TQ63X, so may relate to an adjoining monad.
Kilndown to Scotney	TQ6935	SSSI	(1) 12 August 2017 (2) 16 September 2004	(1) SL (2) JP	(1) Kilndown Wood. TQ 69281 35010 to TQ 69307 35035: six plants in and beside ditch with old bank along east side of ride where not dominated by Bracken. TQ 69339 35071: two plants further along at edge of ditch where enters pipe. (2) Kilndown Wood, TQ696350.
Combwell Wood area	TQ73B		After 1970, before 1981	Philp (1982)	
Kilndown	TQ73C	Combwell Wood is SSSI	(1) 4 September 1990 (2) After 1970, before 1981	(1) FR (2) Philp (1982)	(1) (a) Kilndown Wood, TQ7035, locally frequent below yews. (b) Combwell Wood, TQ7133, on rides (and by FR in this monad, 26 July 1979). (2) -
Bedgebury forest	TQ73F		(1) After 1990,	(1) EGP	

			before 1999. (2) After 1970, before 1981	(2) Philp (1982)	
Bedgebury – west pinetum	TQ7133	Access land	(1) 28 August 2016 (2) 5 September 2015	(1) SL (2) SB	(1) 5 metre strip of plants along ditch beside path, TQ 7191 3326. (2) A few plants beside the lake nr Pinetum entrance, TQ 7159 3328, and also among redwoods at TQ 7172 3336.
Combwell Wood	TQ7134	SSSI	(1) 11 August 2018 (2) 16 June 2018	(1) SL (2) SL	(1) Combwell Wood, Park Wood, damp peaty stream with sphagnum between TQ 7112 3448 and TQ 7111 3453. New colony of four plants along stream edge. Others nearby: four plants at TQ 7112 3452 and 11 plants at TQ 7113 3453. All plants in company with Lady Fern, Bracken and *Dryopteris carthusiana.* In contrast the colony discovered nearby along edges of track on 16 June 2018 now mostly has dead/brown fronds, presumably suffering from prolonged dry period. (2) Combwell Wood, Park Wood, track running south west to north east, through sweet chestnut coppice, TQ 71087 34376 to TQ 71118 34397: 12 plants, TQ 71147 34413: four plants, TQ 71157 34426 & TQ 71182 34439: single plants. Track through hollow in birch woodland, TQ 71263 34513: 15 plants. No plants found far from the track or seen elsewhere in wood.
Bedgebury forest	TQ7232	Access land	(1) 13 ASugust 2023 (2) 17 August 2017	(1) SL (2) KBRG meeting	(1) Bedgebury Forest, TQ 72516 32462. Along open track next to recently coppiced chestnut. (20 At margin of two wide rides at TQ 7252 3247, TQ 7276 3237 and TQ 7288 3239.
Bedgebury forest	TQ7233	Access land	(1) 28 August 2016 (2) 10 August 2011 (3) 3 August 2010 (4) 12 April 2005 (5) After 1990, before 1999 (6) After 1970, before 1981	(1) SL (2) KBRG (3) SB (4) JP (5) EGP (6) Philp (1982)	(1) Pinetum: three separated patches of plants along sloping bank next to path (TQ 72074 33573), four plants under light shade behind bank/path with *Blechnum spicant* and *Polytrichum commune* (TQ 72078 33559), six plants in shady grassland with *Solidago virgaurea* and *Succisa pratensis* (TQ 72085 33611), two large plants in bramble scrub (TQ 72089 33632), two or three plants on bank of stream (TQ 721 335). (2) Many plants on low bank at TQ 7213 3370; and a few scattered plants at TQ 7209 3360. (3) TQ 721 337, Fine colony on a bank by Marshall's Lake. (4) TQ 724 338. (5) & (6) Given as TQ73G, so may relate to an adjoining monad.
Bedgebury forest	TQ7333	Access land	(1)2 July 1999	(1) JP & JW	(1) & (2) TQ 735 330.

			(2) 26 June 1992	(2) JP	
Angley Wood	TQ7535		17 June 2017	SL	(a) Minor track through mature sweet chestnut coppice, north of small stream, TQ 75998 35833 to TQ 75997 35812. Two plants spread out along track where less ground cover/competition with three more further along same track but in different monad, whole colony spanning 45 metre length of the track. Associate species *Hyacinthoides non-scripta, Blechnum spicant, Dryopteris dilatata, Rubus fruticosus* agg, *Athyrium filix-femina, Castanea sativa*. (b) Main track running north eastwards on high sandy plateau, approx TQ 7583 3589. Single plant on open/managed verge along northern side of main track.
Iden Green area	TQ73N		After 1990, before 2000	EGP	
Angley Wood	TQ7635		(1) 17 June 2017 (2) After 1990, before 2000	(1) SL (2) EGP	(1) Angley Wood, minor track through mature sweet chestnut coppice, north of small stream, TQ 76024 35856 to TQ 76009 35843. Three plants spread out along track where less ground cover / competition with two more plants further along same track but in different monad, whole colony spanning 45 metre length of the track. Associate species *Hyacinthoides non-scripta*, *Blechnum spica*nt, *Dryopteris dilatata*, *Rubus fru*ticosus agg, *Athyrium filix-femina*, *Castanea sativa*. Track perhaps has the same footprint as that depicted on the 1870 OS map. Species was recorded at Angley Wood from 1950s to 1980s, but earlier records come from the northern half of wood, monads TQ7536 & TQ7636. (2) Given as TQ73T, so may relate to an adjoining monad.
Angley Wood	TQ7636		(1) 26 June 2022 (2) 31 May 2021	(1) SL (2) SL	(1) Angley Wood, Burnt Bank Wood, TQ 7602 3645. Single plant along path. (2) Angley Wood, public footpath, TQ 7614 3635. Single plant with freshly emerged fronds along shady edge to footpath.
Goddards Green, HemstedForest	TQ83C, includes TQ8135	Access land	(1) 31 July 2021 (2) 29 July 2021 (3) after 1990, before 1999 (4) 21 June 1972	(1) SL (2) KBRG meeting (3) & (4) EGP	(1) Hemsted Forest, Farningham Wood, TQ 8136 3524. Pine plantation with scrubby flushed ditches running down slope. Further three new plants in scrubby runnel, in addition to plant seen at KBRG meeting. (2) Under a scots pine plantation at TQ8136 3525 in a ditch hollow with sphagnum.

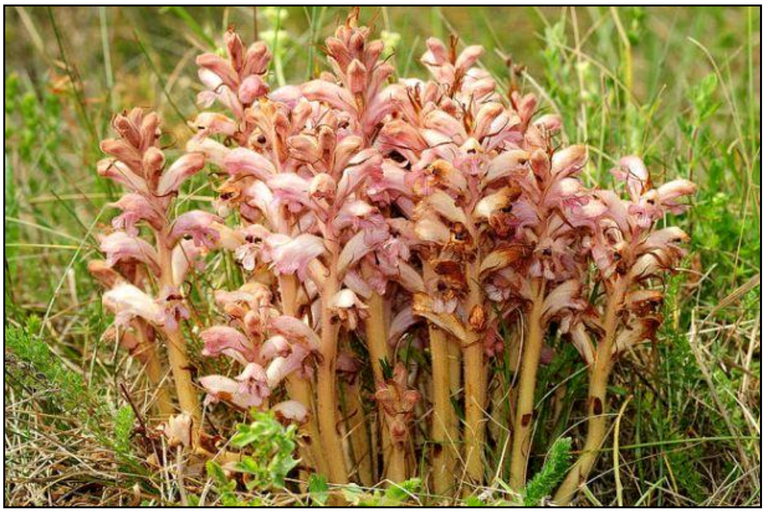
					(3) TQ83C (4) Benenden School grounds, specimen in **MNE**.
Sissinghurst east	TQ8037	Access land	12 August 2021	KBRG meeting	A few plants by a pond, TQ 80724 37976.
Sissinghurst Castle	TQ83E Includes TQ8038, TQ8138	SSSI	(1) 12 August 2021 (2) 25 August 2011 (3) After 1970, before 1981.	(1) KBRG meeting (2) SB (3) Philp (1982)	(1) One large clump under chestnut coppice at TQ 80042 38546 with around 10 small plants scattered close by. (2) 6 plants Beside woodland ride, six plants at TQ 81225 38041 and two at TQ 81182 37983. (3) Given as TQ83E.
Hemsted Forest	TQ8236	Access land	(1) 30 June 2006 (2) 6 September 1986	(1) JP & DM (2) CJ	(1) TQ 820 362; a 1985 record by JP also refers to occurrence along damper, shady stream- and ditch-sides (2) TQ820362..
Woodchurch	TQ93M		After 1970, before 1981	Philp (1982)	[There is an old record for Cole Wood.]
Rhodes Minnis	TR14L		After 1970, before 1981	Philp (1982)	[An unexpected location]
North of Stowting	TR14G		After 1970, before 1981	Philp (1982)	[An unexpected location]
East of Stelling Minnis	TR14T		After 1970, before 1981	Philp (1982)	[An unexpected location; presumably Elhampark Wood, specimen coll. Miss B. Nash 2 September 1972 in **MNE**.]

Orobanche caryophyllacea Sm. (Bedstraw or Clove-scented Broomrape)

vc 15

Rarity / scarcity status

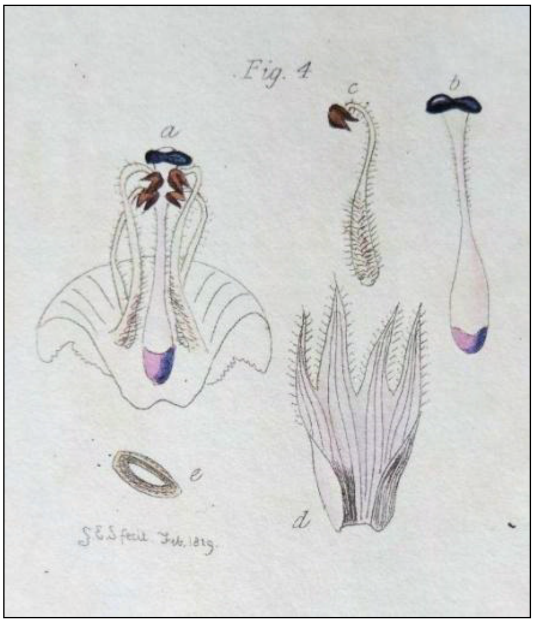
Orobanche caryophyllacea grows as a parasite on the roots of, mainly, *Galium album* (Hedge Bedstraw, formerly *G. mollugo*), but also *Galium verum* (Lady's Bedstraw). Despite the host plants being widespread, the native distribution of *Orobanche caryophyllacea* is restricted to East Kent. It appears that earlier records elsewhere have been errors or at best dubious. In conservation risk terms, it is regarded as **Near Threatened** in England and Great Britain as a whole. It is a **nationally rare** plant, protected from sale, picking and uprooting under Schedule 8 of the Wildlife and Countryside Act 1981. In Kent it is verging on **scarce**, although very locally frequent. It is a Kent axiophyte and so is indicative of good habitat.



Sandwich Bay. Photo by Lliam Rooney, 22 June 2010

Account

The first Kent (and British) record of Bedstraw Broomrape is by G.E. Smith in Loudon's *Magazine of natural history and journal of zoology, botany, mineralogy, geology and meteorology* Vol.1. He wrote to the editor from Sandgate in August 1828 stating that the species 'occurred rather abundantly, in May, in hedges at the foot of the chalk in this neighbourhood, parasitical upon *Galium mollugo*, *Rubus fruticosus*, etc.'. This description is elaborated in his *Catalogue of rare and remarkable phaenogamous plants, collected in south Kent* (1829), where he refers to it 'in hedges and waste ground below Caesar's Camp Hill, the Sugar-loaf Hill, in Eastwear Bay, near Lydden Spout, and eastwards, to Dover'. The *Magazine* note was evidently put forward by Smith in order to secure early recognition of this remarkable discovery (and also to draw attention to features of *Medicago denticulata*, now *Medicago polymorpha* (Toothed Medick), which had particularly interested him) but it also supplies evidence of the Catalogue publication being then (August 1828) 'from necessity, delay[ed] for a few months'. Whether or not the late discovery of *Orobanche caryophyllacea* was one of the causes of delay, he was still working on the plates in February 1829, one of which included the stamens, style, calyx and stem section (reproduced here)[511]. It shows clearly the characters of purple stigma-lobes and filaments hairy from base to apex.



From G.E. Smith's *Catalogue* (1829)

The *Orobanche* continued to be seen in the area, for example by the author of a *List of Plants collected about Dover, Walmer, Folkestone, and Sandgate from the middle of May to the beginning of July, of the past year,*

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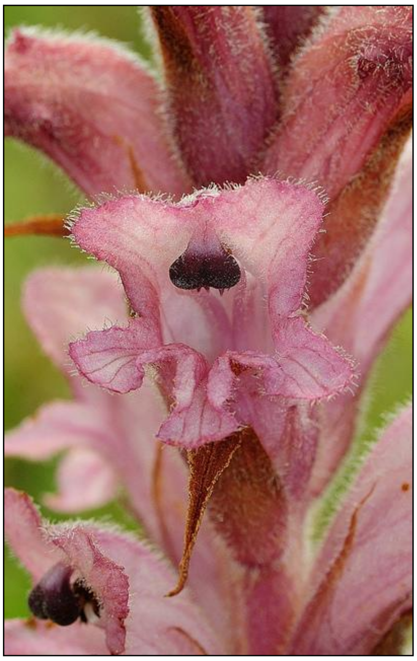
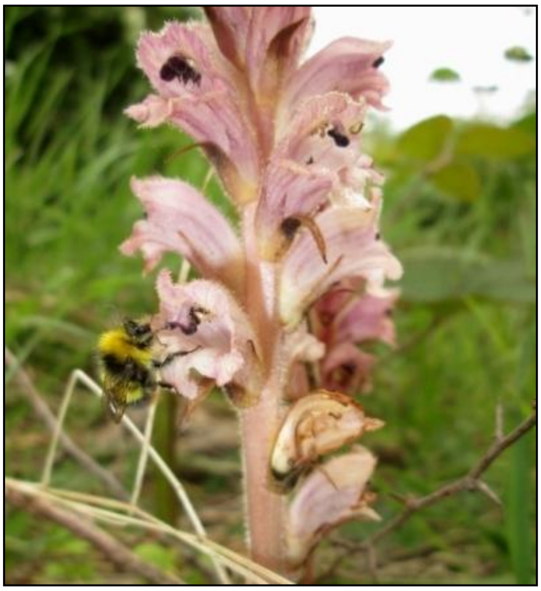
[511] A more professional illustration, prepared by James Sowerby junior in May 1830, was published in Hooker, W.J. *et al.* (1831) *Supplement to the English Botany*, Vol. 1, London.

1860[512] who found that ‘It is certainly very abundant, almost covering the piece of waste ground between the Shakespeare’s and Abbott’s Cliff tunnels, and extending up the side of the latter nearly to the top. It was so matted together with *Lotus corniculatus* and *Galium Mollugo*, that I had some trouble to find out on which it was parasitic. After several ineffectual attempts with the trowel, I at length succeeded in digging one out with the *Galium* attached to it’. This site would have related to a time when the chalk rubble works platform for railway construction was fairly new and perhaps lightly vegetated, in effect a new section of undercliff. It was since altered and extended using materials unsuitable for a chalk flora, and reducing the impact of sea spray; and afterwards extended even further by the creation of Samphire Hoe with chalk spoil which, in 2019, the Broomrape was found to have colonised.

The species grew very close to the sea in this area. Rosemary FitzGerald[513] noted that Frederick Hanbury had found it ‘close to high water mark’ in 1873, and Arthur Bennett[514] on herbarium labels remarked on favourite sites having been washed out to sea. The early Dover-Folkestone records point to a favoured habitat being the bases of chalk hills and cliffs, where erosion leads to instability and open conditions. So it may be that construction of concrete sea defences protecting the undercliff from here to Lydden Spout has similarly since reduced the availability of open and unstable chalk surfaces which would otherwise have provided habitat for *Orobanche caryophyllea*. As regards the inland chalk hill base habitat, Henry Ullyett says in relation to Castle Hill in his *Rambles of a Naturalist round Folkestone* (1880) ‘All along the hedgebank at the foot we find the parasitic Broomrapes (*Orobanche*)’. When we put this together with G.E. Smith’s account, it is a reasonable assumption that the reference is to *Orobanche caryophyllacea* (Phil Green, personal communication), apparently in abundance.



Sandwich Bay. Photo by Lliam Rooney, 22 June 2010



Sugarloaf Hill, Folkestone, with pollinating Bumble Bee.
Photo by Phil Green, 9 May 2014

It was found early on that the range of the species was wider than G.E. Smith’s original account: to the west, he collected it at Sandgate, and to the north east it was by 1839 found as far as the undercliff of St Margaret’s. It was also – and this is significant for the different habitat and for the current continuance of the species in Kent – found, according to Hanbury & Marshall (1899), at the Deal sandhills. Hanbury himself collected it on sandhills near Sandwich (since part of the Royal St George’s golf course), and there is an 1878 specimen of his at Manchester Museum. Hanbury and Marshall’s assessment was that it was rare but locally plentiful on banks, cliffs and sandhills near the coast. The sandhills, or sand-dunes, habitat has since become the more important, in terms of the number of plants.

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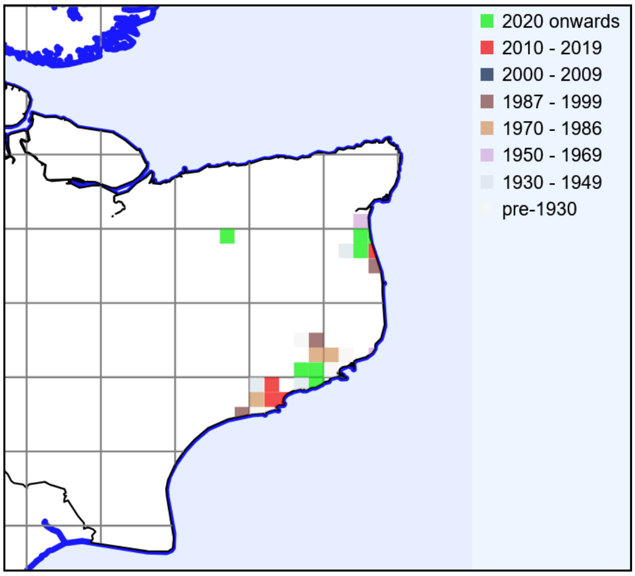
[512] *Phytologist*, N.S. **5**: 33-45.

[513] FitzGerald, R. (January 1988). Orobanche caryophyllacea Smith Bedstraw Broomrape (unpublished NCC report).

[514] He also mentioned this in a note, Destruction of rare British plants in Kent, in *Science-Gossip* (1901) NS **8**: 93, where in addition he attributed losses at the foot of the Shrimper’s Steps to coal mining.

Philp (1982) noted odd plants at Folkestone (TR23D), Dover (TR24W & TR34B) and presence regularly in good numbers at Sandwich Bay (TR35P, T &U): a total of six tetrads, making the species very local and rare. The tetrad total, however, reduced to four in Philp (2010) because the three Dover/Folkestone tetrad occurrences had reduced to one (TR23I). Reliance on the Philp (1982) and Philp (2010) surveys enables ready comparison, but the data were collected in different ways, and do not by any means capture all the records in the relevant periods. The BSBI database has records for 13 different tetrads during the period 1970-2010, with a greater spread in the Folkestone/Dover area, but it still appears as though *Orobanche caryophyllacea* has been declining there. Our 2010-24 records cover 11 tetrads (15 monads), and include some new colonisation; but nonetheless they emphasise the fragility of the originally recognised distribution relating to the base of chalk hills and cliffs.



Orobanche caryophyllacea **Kent records to 2024 mapped at tetrad level, from BSBI database.**

When Rosemary FitzGerald surveyed c.1986, she found five sites on the chalk around Dover and Folkestone, each holding from one to 60 plants. The sand-dune site at the Royal St George's golf course, Sandwich, however, was estimated to hold nearly 1,000 plants. It remains the key population in the British Isles. It was assessed in 2013 at over 250 plants, but in 2018 Sue Buckingham carried out a survey from which she estimated a total of 1,000 in the beach dunes plus up to 400 on the roughs at St George's.

The Broomrape grows here on both *Galium album* and *G. verum* (Lady's Bedstraw). The degree of salt tolerance required here is less than would have obtained in the old chalk undercliff sites. The substrate is also somewhat calcareous, in view of the shell content, and the terrain is not thickly vegetated, as has happened with increased *Brachypodium rupestre* (Tor-grass) dominance in some former chalk sites.

Sandwich Bay, on *Galium verum*. Photo by David Steere, 6 June 2015

A notable extension of range was identified in 2022, with the discovery in a very different habitat by Sian Pettman of what may be the third largest population in the British Isles. This was an inland colony at Old Park, Canterbury, where some 60 plants were found with *Galium verum* in grassland and scrub; the neighbourhood comprises sandy ground (geology: Lambeth Group). It persisted as 48 spikes in 2024. This challenges all our suppositions about the ecology of the species as, although it presumably shares appreciation of a nutrient-poor substrate with the coastal colonies, it is – unless there has been soil importation here (e.g. associated with pylon line construction) – apparently far from growing in the base-rich conditions afforded by chalk.

Orobanche caryophyllacea may readily be identified by its light colour (a range of cream and pink, sometimes reddening) and the clove-scented flowers. The characters of the stigma-lobes and filaments (see G.E. Smith's drawing above) are also relevant; and the shape, illustrated in Stace (2019)[515] and Rumsey & Jury (1991[516]). *Orobanche minor* (Common Broomrape) also grows extensively at Sandwich Bay, parasitic especially on *Eryngium maritimum* (Sea-holly) and so generally growing nearer the beach; but should not be confusable, at least while colouration is retained. Other than in colour, *Orobanche caryophyllacea* is not particularly variable, although three plants of unusual form were found at Sandwich Bay in 2002, in which the flora parts had been replaced by structures resembling typical calyx lobes[517].

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Canterbury, Old Park	TR1758	Outside SSSI	(1) 15 June 2024 (2) 1 June 2024 (3)1 June 2022 (4) 29 May 2022	(1) RM (2) AL, CO & TS (3) SB & CO (4) SP	(1) TR 170 581. On land outside the SSSI. (2) TR 1705 5811. About 48 spikes. (3) Confirmed a total of 60 flowering spikes on *Galium verum* in grassland and scrub between the Taylor Wimpey development and the Canterbury golf driving range and centred around TR 1707 5808. They consisted of two at TR 17102 58079, 16 scattered around TR 17079 58080 under pylon line, 31 scattered west of a path between TR 17066 58102 and TR 17062 58088, 6 at TR 17068 58100 and five at TR 17062 58115. All plants within a few metres of a couple of small grassy paths. (4) A large patch, photographed.
Sandgate	TR1935		(1) 1991 (2) 22 June 1986	(1) Anon. (2) FR & RF	(1) TR 193 352, site discovered to be in course of development and tipped over; original turf and topsoil rescued but no reappearance of plants reported. (2) TR193 352, eight flowering plants at Hospital Hill, Sandgate on *Galium mollugo*. [There is also a 1982 record of a patch of 3 tall spikes and another of 4 smaller ones, recorder may not be correctly assigned.]
Folkestone Downs	TR2138		1991	NJ	TR 212 382, Folkestone Escarpment,-Environmental Management & Monitoring Prog.
Sugarloaf, Folkestone Downs	TR2237	SSSI	(1) 9 May 2014 (2) 1992 (3) June 1985	(1) PG (2) ND (3) JP	(1) TR 223378 just above lower footpath which runs above scrub at Sugarloaf Hill base. Two flower

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[515] Stace, C. (20!9). *New Flora of the British Isles*, 4th edition. Cambridge.

[516] Rumsey, F.J. & Jury, S.L. (1991). An Account of *Orobanche* L. in Britain and Ireland. *Watsonia* **18:** 257-295.

[517] Rumsey, F.J. & Rumsey S.M. (2003). An unusual floral mutation in *Orobanche caryophyllea*. *BSBI News* **93:** 79.

					spikes c. 1” apart, with pollinating bumblebee (maybe *Bombus pratorum*) in recently trimmed bramble with scrub behind, recorder has seen it in same scrub patch for c.20 years, always at base of the hawthorn bushes (and also saw it around 1989 for a few years very close by, but below path, now gone for many years). Recorder considers the effect of recent scrub clearance will not be beneficial for plant's survival, the only site known to him on Sugarloaf. (2) Three flowering spikes. Seen in 1994? (3) TR 223 378, Sugarloaf Hill, 3 spikes at hill foot above hedge line.
Folkestone Downs	TR2238	SSSI	24 June 2013	SB	Single plant at TR 22999 38031 beside public footpath on Creteway Down. South-facing chalk grassland slope with *Galium album*, *Origanum vulgare*, *Lotus corniculatus*, *Trisetum flavescens* etc. Plant 15 cm tall with 8 flowers.
Folkestone Downs	TR2337	SSSI	(1) June 2014 (2) 20 May 2014	(1) OL (2) SB	(1) (a) TR 23050 37985 - 2 spikes; TR 23045 37981 - 2 spikes; TR 23023 37972 - 1 spike. Believed by recorder to be different from those found previously by SB, being further up slope and to the west. (b) TR 23084 37976 - 3 spikes; TR 23082 37969 - 1 spike over; TR 23081 37968 - 2 spikes; TR 23081 37978 - 1 spike. At bottom of the chalk scrubby grassland close to the houses at the bottom, where previously found by SB. (2) Eight plants with total of 12 flowering spikes. All at the foot of Creteway Down amid scrub of *Crataegu*s and *Viburnum lantana*. Plants from TR 23023 37972 to TR 23077 37968.
Folkestone Warren	TR2437	SSSI, local nature reserve	7 June 2019	AG	Single spike near the entrance to the grazing enclosure, Folkestone Warren at TR 2435 3746. An area of ground where a lot of scrub clearance had taken place in recent years aiming to restore chalk grassland. This record is close to a 1950 Francis Rose record around TR 243 372, East Wear Bay.
West of Hougham Woods	TR2740		(1) 29 June 2020 (2) 1988 (3) 31 May 1988	(1) SB & JPu (2) SH (3) NCC England Field Unit	(1) Chalk grassland bank, Elms Farm. Thirty or more mostly dried up flower spikes scattered from TR 28038 40646 westwards into next monad to TR 27978 40607. Both *Galium album* and *Galium verum* present. (2) TR 272 404. Elms Farm,

					Chilverton, 22 spikes. (2) TR 272 402, Chalk Grassland Plants Survey. [Also identical record under SH's name.] [These may all be the same record.]
Samphire Hoe & Abbot's Cliff	TR2838	SSSI	(1) 23 May 2019 (2) 16 May 2019 (3) 8 July 1986	(1) AG (2) CHo & JHo (3) RF & MJ	(1) Some plants on the cliff near the Abbots Cliff tunnel eastern portal visible with binoculars. Also confirmation of 16 May find. (2) First sighting on Samphire Hoe (see also TR2939), found at TR 2866 3882, spread over a grassland area 2 x 3 metres (26 counted later on 4 June 2019). *Galium album* present in sward. (3) TR 284 388, one flowering spike near an adit from Eurotunnel. [The area between Shakespeare Cliff and Abbots Cliff is clearly a site with a continuity of records of the broomrape - it was said to be 'very abundant' on the 'piece of waste ground between Shakespeare's Cliff and Abbott's Cliff tunnels' in 1860.]
Samphire Hoe & Abbot's Cliff area	TR2839		07 Jun 2021	KS	A group of three flowering plants reported to Paul Holt (of Samphire Hoe) by recorder from c. TR 2885 3940, north side of A20.
West of Dover	TR2840		(1) 29 June 2020 (2) 1990 (3) 1 June 1988 (4) 1988 (5) 7 July 1986	(1) SB & JPu (2) JP & JW (3) NCC England Field Unit (4) SH (5) RF & MJ	(1) Chalk grassland bank, Elms Farm. Thirty or more mostly dried-up flower spikes scattered from TR 28038 40646 westwards into next monad to TR 27978 40607. Both *Galium album* and *Galium verum* present. (2) TR 288 408, Farthinghoe Downs. (3) TR 289 403, West Down, Chalk Grassland Plants Survey. [Also identical record under SH's name.] (4) TR 288 403, Farthinghoe Down, 12 spikes. (5) TR 281 408, at least 60 plants along a hedge at the north end of an arable field west of Elms Farm, Chilverton. [It may be that (2) & (3) are the same record.]
Kearsney	TR2914		1972	KR	TR291437, reappeared in a field, where pipe-laying was thought to have destroyed it in 1971, but on the other side, on railway bank.
Samphire Hoe	TR2939	SSSI	(1) 23 May2019 (2) 16 May 2019	(1) AG (2) CHo & JHo	(1) TR2915 3910, three spikes, with *Galium album* noted in sward (a fourth had appeared by June). Confirmation of 16 May record. (2)With TR2838 (above), first find on Samphire Hoe.

Temple Ewell	TR2944		(1) 1991 (2) 7 July 1986	(1) TM (2) RF & MJ	(1) TR 292 441, near Temple Ewell Down, eight plants. (2) TR 292 441, at least 20 plants in privately owned Malvern Meadow in the village kept as an open space.
Kearsney	TR3045		(1) 1972 (2) 1971	(1) & (2) KR	(1) TR 301 435. (2) TR 301 435, foot of chalk down behind land formerly used for allotments, likely to be developed.
Sandwich north east	TR3458		19 May 2020	SB	A few very short plants in flower on the coastal dunes in very dry warm season.
Sandwich Bay estate (west)	TR3557	Part SSSI	(1) 13 June 2018 (2) 27 May 2017	(1) & (2) SB	(1) 79 flowering spikes counted, of which most were in a small private, fenced area at TR 362 578. With those in the two adjoining monads TR3558 and TR3658, the count totalled 1277. However, recorder considers the figure best given as an estimate of 1000 on the beach dunes and up to 400 in the roughs on St Georges. (2) Three flowering spikes together in an old dune slack at c. TR 357 575 (bird observatory's ringing field).
Sandwich Bay – Royal St George's	TR3558	SSSI	(1) 15 June 2023 (2) 8 June 2023 (3) 13 June 2018 (4) 11 June 2013 (5) 25 June 2010 (6) June 1978 (7) 1978	(1), (2) & (3) SB (4) CO (5) SB (6) MF (7) LF	(1) Royal St Georges golf course, scattered plants mostly in dunes near closest to the sea, for example at TR 25812 58720. (2) Royal St Geoges at TR 3568 58818, scattered plants. (3) 1064 flowering spikes counted, of which 856 were in the dunes on the beach and 208 in the rough of Royal St Georges golf course, where many more were likely to have been hidden in the long grass. (4) Mainly in carpark area but also strip adjoining west side of road including golf links, 250+ plants. (5) (a) TR 35791 58922, 170 plants, many multi-stemmed, in 150 x 24m of dune grassland, probably vulnerable from vehicles parking for the beach, but increasing nonetheless. (b) TR 35784 58943, 77 plants in a 150m stretch of dune grassland, probably vulnerable as with (a) above. (6) & (7) Present.
Sandwich Bay	TR3559	SSSI	(1) 3 July 2016 (2) 6 June 2015 (3) 24 June 2010 (4) 29 June 2008 & 11 June 2006	1) AW (2) DS (3) SB (4) DM	(1) Present. (2) TR 35756 59014, etc., scattered populations along much of beach road area on obvious Bedstraw plants. (3) TR 35658 59153, two plants at edge of Royal St Georges golf course in stabilized sand dune.

					(4) TR 3561 5965
Sandwich Bay – Royal Cinque Ports	TR3655	SSSI	22 June 1999	PC	TR 369 558.
Sandwich Bay estate (north)	TR3658	SSSI	(1) 13 June 2018 (2) 16 July 2013 (3) 3 June 2010 (4) 31 May 2010 54) 9 June 2001	(1) SB (2) CO (3) GK (4) SC (5) RHW	(1) 134 flowering spikes counted, of which 111 were in the dunes on the beach and 23 in the rough of Royal St George's golf course, where more were likely to have been hidden in the long grass. (2) Present. (2) A few plants at TR 36160 58137. (3) TR 361 582. (4) Several plants along roadside just north of village.

Orobanche elatior Sutton (Knapweed Broomrape)

vc 15 and 16

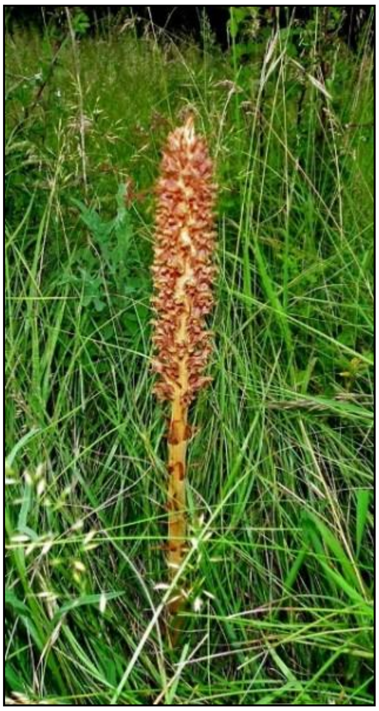
Rarity / scarcity status

Orobanche elatior grows as a parasite on *Centaurea scabiosa* (Greater Knapweed) on chalk and limestone in south and east England, reaching its northern limit in Yorkshire. Its conservation risk in England is regarded as one of 'Least Concern', based on records between 1930 and 1999, but if records after 1987 are assessed in relation to all records, including those before 1930, then a 31% decline is shown. In Kent, it has been regarded as very rare, but is currently **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Longfield. Photo by David Steere, 16 June 2014

Account

The first published account of Knapweed Broomrape in Kent is usually given as by Thomas Forster who, in his *Flora Tonbrigensis* (1816), described it as 'In fields and margins; in the way to the High Rocks through Mr. Fry's Farm'. The *Flora* covers plants in Sussex as well as Kent, but it appears that the way mentioned was from Tunbridge Wells, and so is likely to have passed along the Kent side of the county boundary until High Rocks (in Sussex). It is not now an area within the usual distribution of the host plant, *Centaurea scabiosa*, but Forster said that the latter was then not uncommon in his area, in cornfields and field margins. Still, some doubt must attach to this record, not least in that there is a specimen of *Orobanche rapum-genistae* (Greater Broomrape) in **MNE** from High Rocks (1849), which would be more likely. Hanbury & Marshall (1899) considered *Orobanche elatior* to be a very rare plant of banks and field-borders and gave only eight records, one of them (at Bigberry Woods) considered dubious and the only one with any detail (from Daniel Cooper's *Flora Metropolitana*, 1836) refers to fields in the Woolwich area where the substratum appears to be sand and gravel, which is not promising. On the whole, none of these records is particularly satisfactory except, perhaps, for one near Dover. Francis Rose thought the High Rocks, Bigberry and Woolwich records more likely to be *Orobanche rapum-genistae*.

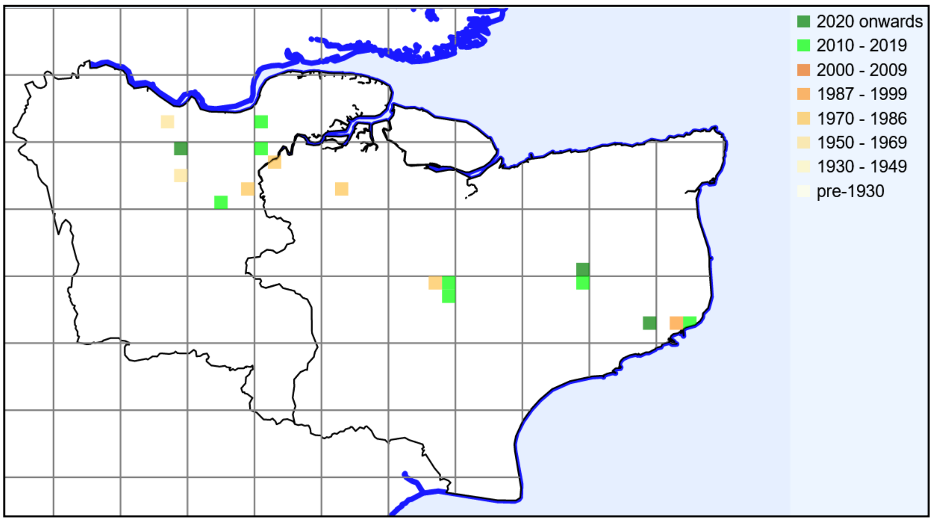


Longfield. Photo by David Steere, 16 June 2014

It is a plant more to be expected on the chalk and so discoveries along the Pilgrim's Way at the foot of the chalk downs provide a much more plausible pattern. In 1913 it was collected by H. Elgar by Pilgrim's Way between Detling and Boxley; in 1915 he found it along the section north of Trottiscliffe church, which may well be the Trottiscliffe site mentioned by Marshall in the *Victoria History of the Counties of England: Kent* (1908); and in 1923 it was reported by Miss Cobbe along the road at Westwell. There is continuity in that the Trottiscliffe site was known to Francis Rose in 1945, 1955 (when there were 29 spikes) and 1957; Owen Davis saw it there, 1958-61; and Lorna and Derek Holland found plants just north of the road, 2010-11. Also in 2010-11, it turned up on a KWT roadside nature reserve at Pilgrim's Way, Westwell, demonstrating over 80 years' continuity. Francis Rose regarded it as very rare on grassy banks, scrub, and old pits on chalk, citing further records at Stone, Bean, Cliffe, Cuxton, Wouldham, Kingston, Bekesbourne, Adisham, following the chalk across the county. Philp (1982) showed a comparable spread for 1971-80 with eight tetrad records; but for 1991-2005, Philp (2010) the number had reduced to two, at Westwell (TQ94Z) and Dover (TR34G), so that it was then ostensibly very rare. However, it looks as though this apparent decline is an artefact of recording, as our 2010-24 records amount to ten tetrads (11 monads). Three of the 2010-24 sites corresponded with those in the 1971-80 survey so, again, there is some continuity, although limited.

Lower Higham. Photos by Lliam Rooney, 19 July 2011

***Orobanche elatior* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Any identification issues with *Orobanche elatior* in Kent usually revolve around whether the plant is a small version of *Orobanche elatior* or a vigorous specimen of *Orobanche minor* (Common Broomrape). The latter species is extremely variable, but the calyx-lobes supply a distinction: in *O. elatior* the two bi-lobed segments are touching or fused at their base under the corolla.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Longfield / Fawkham	TQ5968		(1) 11 August 1985 (2) After 1970, before 1981	(1) GK (2) Philp (1982)	(1) Chalk grassland of hedge-bank. (2) Given as TQ56Z in Atlas. Atlas correspondence indicates this is a record by P.C. Hall in 1972, below hedgerow across chalky hillside opposite Fawkham Church, TQ 595 682. [Probably better given as TQ 5968 6825.]
Longfield	TQ5969	KWT managed reserve	(1) 17 June 2020 (2) 29 May 2020 (3) 7 June 2019 (4) 20 June 2015 (5) 19 June 2014 (6) 16 May 1986	(1), (2), (3) & (4) DS (5) DS & GK (6) RF	(1) One additional flowering spike on *Centaurea scabiosa* in a different area than where seen before at TQ 5959 6910. (2) Three spikes emerging on *Centaurea scabiosa* in a different place (but close) to previous sightings. TQ 59619 69091. One spike seen at TQ 5963 6909 very close to previous sightings of this plant. In this case, both *Centaurea scabiosa* and *Centaurea nigra* agg. were very close to the emerging spike and both were very stunted (3) TQ 59645 69088, one plant in completely different place to 2014. None of the plants seen in 2014 have re-appeared. (4) TQ 5963 6907 and TQ 5963 6908, one plant at each, found by DS earlier in June, when there was a third plant, since disappeared. A fourth plant seen by DS on 25 June 2014, c. 20 yds away from the rest, with *Centaurea scabiosa* close by. Chalk grassland. (5) TQ 596 691, associated species with *Cerastium brachypetalum*.
Darenth Wood	TQ57R & W		(1) 9 June 2001 (2) 1985	(1) JP (2) JRP	(1) Opposite Darenth Wood, south-facing road-verge, A296 above Bluewater pit. (2) TQ57R, edge of large pit, N of old A2.
Trosley Country Park	TQ6461	SSSI, KCC managed park	(1) 4 June 2011 (2) 28 July 2010 (3) 19 July 1986 (4) After 1970, before 1981	(1) & (2) LH & DH (3) WFS meeting (4) Philp (1982)	(1) TQ 64717 61230, three large plants and a small one (further up quarry not explored). (2) TQ 64721 61221, three dead spikes. (3) Former chalk pit just north of Pilgrim's way. (4) Given as TQ66K, so possibly an adjoining monad.
Upper Halling	TQ66W		After 1970, before 1981	Philp (1982)	
Ranscombe	TQ7168	Railway land	26 June 2015	DS	TQ 71019 68688, three plants gone over but distinctively different from *O.minor*. On HS1 railway line verge, stunted Knapweed at base of each.
Rochester (vc15)	TQ76I		After 1970, before 1981	Philp (1982)	
Lower Higham	TQ7172		13 July 2011	BS (det. SB)	25 spikes on *Centaurea scabiosa*, alongside public footpath.

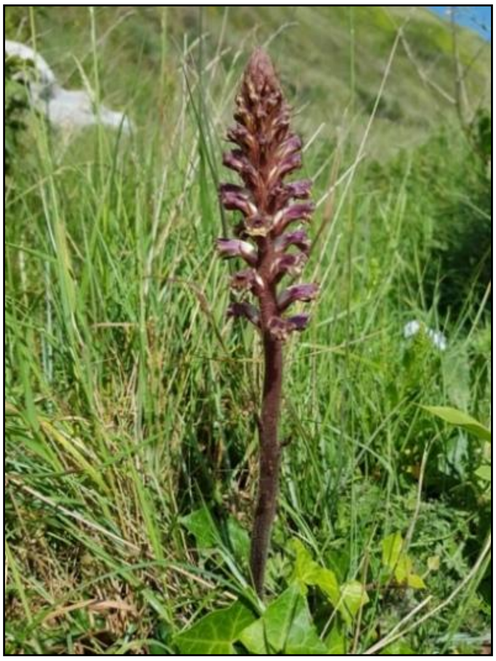
Hartlip – Yelsted area	TQ86G	SSSI, KWT	After 1970, before 1981	Philp (1982)	[Not stated, but presumably Queendown Warren, which has reserve records 1970-77.]
Westwell	TQ94U	KWT roadside nature reserve	(1) May 2011 (2) 8 June 2010 (3) After 1970, before 1981	(1) & (2) GT (3) Philp (1982)	(1) Broomrape spike at TQ 983478 984479 quite close to road, as in previous year. In bud, 19 May 2011. (2) TQ98387 47898, one spike just starting to flower at RNR perilously close to road. Visited by GK later in 2010 and conf., but spike broken off. (3) [Atlas correspondence says 'fairly common along the Pilgrims Way on Westwell Down'] [There is a 1923 record for Westwell.]
Dunn Street	TQ94Z		(1) After 1990, before 2000 (2) After 1970, before 1981	(1) EGP (2) Philp (1982)	(1) – (2)) [Atlas correspondence says 'fairly common along the Pilgrims Way on Westwell Down']
West of Barham	TR1849	Private land	10 June 2014	SB	11 flowering spikes on privately owned chalk grassland bank, scattered from TR 1864 4994 to TR 1870 4997 on *Centaurea scabiosa.* The site protected and managed by the owner.
Kingston	TR15V, includes TR1850, TR1950		(1) 1 July 2020 (2) 25 June 2016 (3) 10 June 2014 (4) After 1970, before 1981	(1) SB (2) SC (2) SB (3) Philp (1982)	(1) Hearts Delight meadows Two plants with dried up flower spikes at TR 1962 5037 and at TR1963 5042. Both parasitising rayed *Centaurea scabiosa* on thin chalk in a sown butterfly mix. Recorder was able to make positive identification from large corolla measuring 19.5 mm and anther position with insertion point 4.5 mm abve base of corolla tube. filament very hairy from the base to about three-quarters of length. Seed likely to have blown in from large colony of *Orobanche elatior* about one kilometre to the west. (2) TR 186 501. (2) 20 flowering spikes on privately owned chalk grassland bank, scattered from TR 1873 5003 to TR 1878 5007 on *Centaurea scabiosa*. The site protected and managed by the owner.
Monkton chalk pit	TR2865	Nature reserve and Local Wildlife Site	2 August 2005	JW	TR 284 656.
Dover Oldpark	TR2943	KWT reserve	2 June 2023	SC	Chalk; rour spikes together at TR 29821 43421 and three at TR 29838 43411 opposite bus stop on A256
Dover	TR34G		After 1990, before 2000	EGP	

Orobanche minor Sm. subsp. *maritima* (Pugsley) Rumsey (Carrot Broomrape)

vc 15

Rarity / scarcity status

Orobanche minor subsp. *maritima* is a parasitic plant mostly restricted to the coasts of southern England where its usual host plant *Daucus carota* subsp. *gummifer* (Sea Carrot) grows. Its threat status in both England and Great Britain as a whole is regarded as of 'Least Concern', but it is **nationally scarce**. It is very **scarce** in Kent where it is an outlier from other English populations.



Samphire Hoe. Photo by Sue Buckingham, 3 June 2019

Account

The earliest Kent specimen given in the BSBI database is a gathering from Dover in 1833 at the herbarium of the Royal Botanic Garden, Edinburgh, identified by Fred Rumsey. However, the herbarium of Dillenius (1684-1747) includes a specimen marked '*From amongst Mr. Sherard's plants… On Dover Cliffs, Kent*' which Druce[518] thought to be the earliest British example of *Orobanche amethystea* (a name mistakenly used for Carrot Broomrape at the time that Druce was writing). Although Dillenius was closely associated with William Sherard (1659-1728), who afforded him patronage, it may well have been James Sherard (William's younger brother) who was responsible for collecting the specimen, given that he was known to have botanised the Dover cliffs in 1714 (for which there is an account by James Petiver[519]).

The name *Orobanche amethystea* was also used by J.T.B. Syme in the third edition of *English Botany* (1866, vol. 6) for Carrot Broomrape found on the under-cliff, south-east of St. Margaret's Bay. He suggested, however, that the plant might perhaps be regarded as only a variety of *Orobanche minor* (Common Broomrape), a re-naming which did not take place until 1991. Other old records include F.J. Hanbury's pre-1899 find on the undercliff at Lydden Spout, which must have been close to Arthur Bennett's sighting:[520] 'From 1871 to 1878 near Dover, at the foot of the Shrimpers' steps to beyond the base of Abbott's Cliff, hundreds of specimens occurred in June'. (The Shrimpers' steps, all 444 of them, emerged at the beach between Shakespeare and Abbott's Cliffs at the west end of what is now Samphire Hoe.) This area still held plants abundantly for Francis Rose (1945-62). He also noted it at the base of cliffs south of Oldstairs Bay, Kingsdown (1956); at St. Margaret's Bay (1957-62), including Syme's old site (1946-47); at Dover East Cliff (1954); Langdon Bay; and Folkestone Warren on *Daucus* (1959). The historic range of Carrot Broomrape therefore seems to have centred on Dover, extending to Folkestone Warren in the south east and Oldstairs Bay in the north west.

The known range as at 2006 is described by Rumsey (2007)[521]. It comprised plants on cliff ledges and cliff-tops at Lydden Spout (TR2939); Samphire Hoe (TR3039); Lighthouse Down west of St. Margaret's Bay (TR3644); and between Monument and St. Margaret's Bay (TQ3744). All these populations were small, not exceeding 60 plants together and often with a much lower annual count. Those in the St. Margaret's Bay area were considered to have a long term survival issue with cliff erosion immediately west of the bay, coupled with dense tree shading of ledges behind the bay. This range amounts to about 10km of coastline, and so was shortened by about 2.5km northwards from the historic maximum at Oldstairs Bay and about 3km south westwards from the opposite maximum at Folkestone Warren. However, a 2021 find on the undercliff at the eastern end of Folkestone Warren has restored the historic maximum at this end.

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[518] G.C. Druce (1907). *The Dillenian Herbaria,* Oxford, at p.147.

[519] Journal of a Botanical Tour from London to Dover...from the Sloane MSS '*Adversaria Petiveriana*' (1862) *Phytologist* **6**: 114-120.

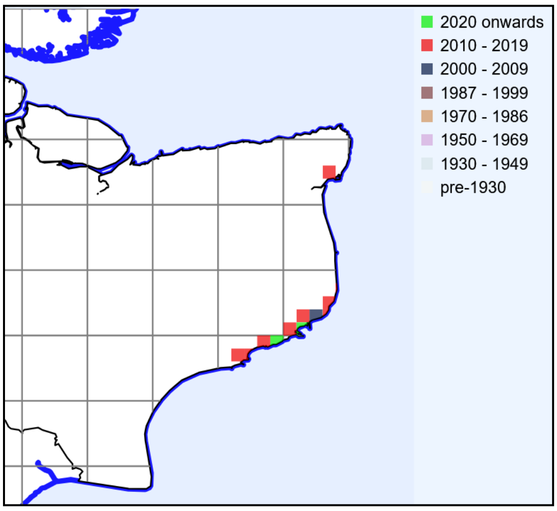
[520] Bennett, A. (1928). *Notes on Orobanche*. Journal of Botany **66**: 167-169.

[521] Rumsey. F.J. (2007). A reconsideration of *Orobanche maritima* Pugsley (Orobanchaceae) and related taxa in southern England and the Channel Islands. *Watsonia* **26**: 473-476.

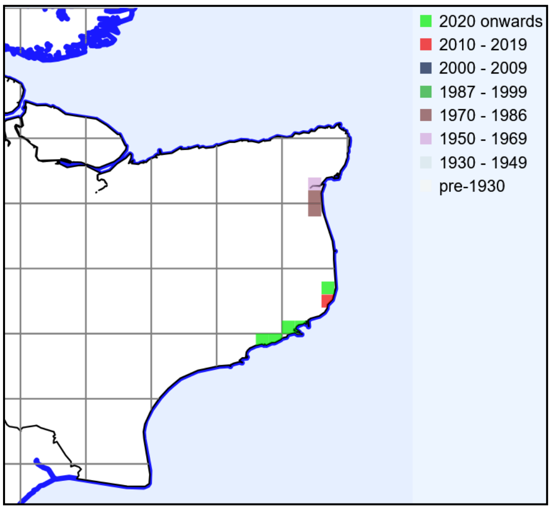
Samphire Hoe. Photo by Sue Buckingham, 13 June 2021

There are purported records outside this range which have been disregarded for the purposes of this register, in particular at Sandwich Bay, where given by the map accompanying Rumsey (1994)[522], by the BSBI database and by Francis Rose's manuscript *Flora of Kent*. (The taxon here is likely to be that now known as *Orobanche minor* var. *pseudoamethystea*.) The problem relates to the Broomrape's host plant, and where this is *Eryngium maritimum* (Sea-holly). Rumsey (2007) explains how the former use of the name *Orobanche amethystea* (a Continental taxon parasitical on *Eryngium*) and Syme's *English Botany* account mentioned above may have operated to etablish in public botanical consciousness a link between parasitism of *Daucus* and *Eryngium*.

The host plant of Carrot Broomrape, however, is normally – i.e. almost always – *Daucus carota* subsp. *gummifer* (Sea Carrot), and a map of that plant's Kentish distribution is given here: it coincides quite closely with that of Carrot Broomrape. This is not to say, however, that it has no other hosts. Pugsley (1940)[523] thought that *Plantago lanceolata* (Ribwort Plantain), *Ononis repens* (Common Restharrow) and *Daucus carota* subsp. *carota* (Wild Carrot) were also at times host plants; *Plantago coronopus* (Buck's-horn Plantain) has also been noted. The position as regards *Daucus carota* may be complicated by the potential for intermediates between subspp. *gummifer* and *carota*. It may be that some variability in Carrot Broomrape is associated with this host variability (Fred Rumsey, personal communication).



***Daucus carota* subsp. *gummifer* Kent records to 2024 mapped at tetrad level, from BSBI database.**



***Orobanche minor* subsp. *maritima* Kent records to 2024 mapped at tetrad level, from BSBI database. (The Sandwich Bay records should be disregarded.)**

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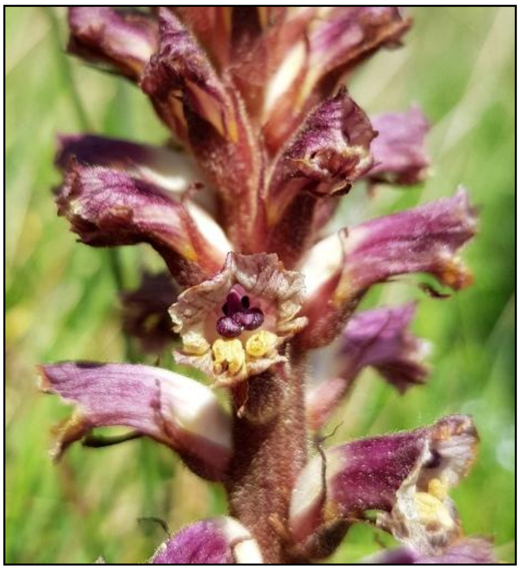
[522] Rumsey, F.J. (1994). *Orobanche minor* Smith var. *maritima* (Pugsley) Rumsey & Jury. In Scarce Plants in Britain (1994), (eds.) A. Stewart, D.A. Pearman and C.D. Preston, JNCC, Peterborough.

[523] Pugsley, H.W. (1940). Notes on *Orobanche* L. *Journal of Botany* **78**: 105-116.



Carrot Broomrape is distinguishable[524] from *Orobanche minor* subsp. *minor* by its strongly purple coloration, pronounced bulbous base, squatter corollas compacted in the top third of the flower spike, and the middle lobe of the corolla's lower lip being the largest, reniform, with pronounced yellow bosses. It is fairly similar to *Orobanche picridis* (Oxtongue Broomrape), which grows in the same area, but has more purple stems with a less bulbous base, shorter bracts and calyx lobes, and has the distinctive paired yellow bosses mentioned above. The distinction between Carrot Broomrape and Oxtongue Broomrape is not always clear, and plants have been found in Kent which appear intermediate and which are consistent with artificial hybrids. Nevertheless, DNA evidence for the presence of natural hybrids in Kent has not yet been forthcoming, although such evidence has shown gene flow between the two Broomrapes in populations in Cornwall and Guernsey.[525]

Samphire Hoe. Photo by Sue Buckingham, 3 June 2019

Site	Grid reference	Site status	Last record date	Recorder	Comments
Capel-le-Ferne east	TR2638	SSSI	10 June 2021	AG	29 spikes counted from the undercliff at TR 26543 38444 just above the sea wall all close to *Daucus carota*. A further visit on 19 June found more plants spreading eastwards over 250 metres to TR 26809 38483. Photos were sent to FR who said he would probably have to agree subsp. *maritima* but added that in the corolla shape they look rather like *O. hederae* and also have a *O. picridis* hint in the sepals and porrect upper lips; he could not say definitely say that there was introgression from other taxa in sect. *minores* but agreed that plants atypical and certainly had characteristics suggestive of this.
Samphire Hoe west	TR2838	SSSI	(1) 3 June 2019 (2) 7 August 1976	(1) SB (2) LF & EGP	(1) Two fine specimens, one in flower at and a second in bud on *Daucus carota* at the base of the cliff TR 28346 38754 and the other a few metres east. Large yellow bosses on lower lip of corolla. (2) TR 282 388.
Dover Aycliff north	TR3040	SSSI	8 May 2022	JM	Single spike in Whitecliff's St David's Field at TR 30341 40062.
Dovder castle	TR3241	SSSI	27 May 2024	DS	TR 3271 4163, parasitising a flowering but stunted, *Daucus carota* subsp *gummifer* plant on castle wall.
St Margaret's at Cliffe Bay	TR3644	SSSI	July-August 2015		TR 3670 4403, one plant.
Kingsdown south	TR3746	SSSI	14 June 2023	SB	Clifftop grassland, one flowering plant at TR 37914 46495.

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[524] Cf. Thorogood, C. & Rumsey, F. (2021). *Broomrapes of Britain & Ireland, BSBI Handbook 22*. Botanical Society of Britain and Ireland, Durham.

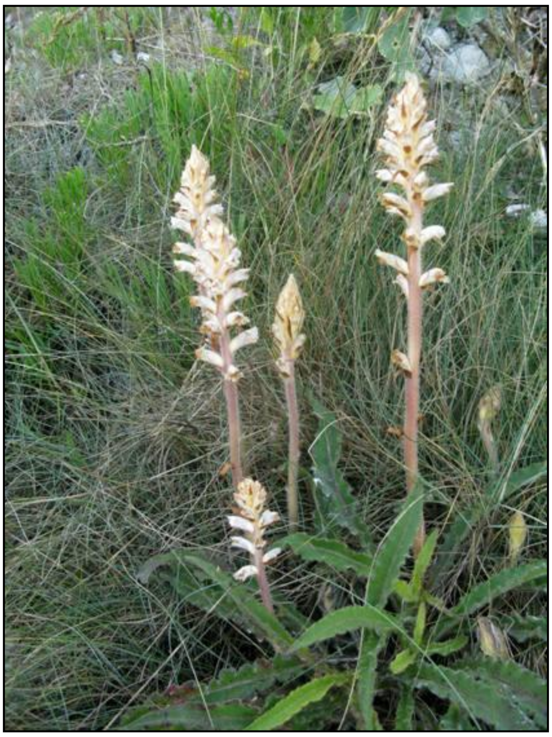
[525] . Thorogood, C.J. & Rumsey, F. (2020). An account of Common Broomrape *Orobanche minor* (Orobanchaceae) in the British Isles, *British & Irish Botany* **2(3)**: 223-239.

Orobanche picridis F.W. Schulz (Oxtongue Broomrape)

vc 15

Rarity / scarcity status

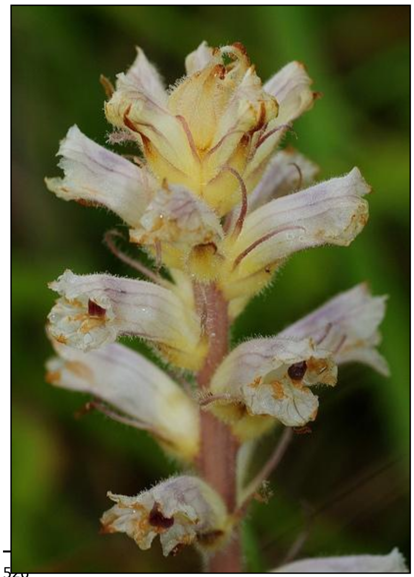
Orobanche picridis grows as a parasite, lacking chlorophyll, almost exclusively on *Picris hieracioides* (Hawkweed Oxtongue) in the Isle of Wight, Glamorgan and East Kent. It was thought to be more widespread earlier on, but many of those records are probably in error. It is **nationally rare**, considered perhaps to be Britain's rarest broomrape, and is treated as **Vulnerable** to the risk of extinction in both England and Great Britain as a whole. Protection from sale, picking and uprooting is afforded by Schedule 8 of the Wildlife and Countryside Act 1981. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006, having previously been a UK Biodiversity Action Plan priority species with planned actions to undertake management at sites to prevent scrubbing up of undercliff areas which will shade populations on cliff faces and, where populations occur in cliff-top situations, to maintain or restore light grazing management. It is **scarce** in Kent, along just over 8km of the coast, and the populations are of national significance. It is a Kent axiophyte and so is indicative of good habitat.



Kingsdown, with *Picris* leaves. Photo by Sue Buckingham, 3 July 2011

Account

The first publication of Oxtongue Broomrape in Kent was in *English Botany* (3rd edition, vol. 6, 1866, ed. J.T. Boswell), where it is described as 'very abundant on the undercliff between St. Margaret's Bay and Kingsdown, South Kent... Probably frequently passed over as O. minor'. Hanbury & Marshall (1899) gave this record and one from Deal (by H.C. Watson), but nothing else: presumably collected material (including by Hanbury in 1878) was regarded as falling within the description of the first record, but it does appear that there are earlier specimens, before the taxon had been recognised in the British Isles.[526] Francis Rose saw plants only on the ledges of steep chalk cliffs, including at Dover East Cliff (where it was reported in 1947, with records in most years to 1962) and at St. Margaret's Bay, where it was abundant in 1957, and a site ¼ mile north east, where present in 1946 and 1947, but not seen in 1953. He also received reports of the Broomrape's presence on waste ground south of Ebbsfleet House, Richborough Port by various botanists in 1949 and 1962.



Dover. Photo by Lliam Rooney, 12 July 2010

The 'classic' Dover site continue to provide finds for visiting botanists, but records tailed off in the St. Margaret's area and from around 1960 it was considered lost there - Philp(1982) says that repeated searches had failed - until 1986, when Rosemary FitzGerald saw about ten plants on the steep ledges of the undercliff. There were none in either site in 1987 and, while it is fair to say that there are population fluctuations from year to year, she pointed out[527] that the species seemed to have been more abundant before, at least in the 19th century and the reasons for its apparent decline were then not completely clear. The position for the period 1991-2005, as far as known to Eric Philp, was assessed in Philp (2010) as one where 'At Dover TR34F & 34G ...numbers can vary between 1 and 50, and on the cliffs at Oldstairs Bay TR34Y...up to ten flowering spikes most years'. However, 'This is a significant under-estimate' (Rumsey & Thorogood, 2023): the pattern of occurrence is considerably more variable than indicated by this comment and colonies had been overlooked.

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[526] For example, a specimen collected by N.B. Ward from Kingsdown on 27 July 1837 in BM, noted by Fred Rumsey (March 2021), Oxtongue Broomrape (*Orobanche picridis* F.W. Schultz) in the British Isles; an historical appraisal and survey with recommendations for conservation management. There were also specimensd gathered in 1840 by G.E. Smith at Dover and Miss E. Harvey from the underdcliff at St. Margaret's (Rumsey & Thorogood, 2023).

There is now a considerable amount of distributional data from the 1990s onwards, thanks to the work of Fred Rumsey, and the rest of this account borrows heavily from this. Indeed, there is much more than could be included here without this account becoming disproportionately large in relation to other accounts.[528]

Dover Patrol (The Cut) cliff-top habitat. Photo by Fred Rumsey, 13 July 2007.

In 1991, Fred Rumsey became aware, through his discovery of *c*.23 flowering plants on ledges at the eastern end of St. Margaret's Bay, that the species, although extremely rare, was being overlooked. This was reinforced by a request for an identification check in relation to plants on a trackway above Dover Harbour, which turned out to be *O. picridis.* These events provided an impetus for annual surveying, which began in 1997, initially covering the then known areas of recent occurrence from Dover Harbour to just past Dover Patrol, and after 2004 extended to the Kingsdown ranges. Surveying is undertaken in late July / early August, at the end of the flowering period, and when damage to emerging plants may be avoided; and the Broomrape is often best found by targeting its host plant. *Picris hieracioides*. Nevertheless, plants are easily overlooked, being small (in the books, to 60cm, but in practice often less than 12cm), with few flowers (often less than ten) and in cliff edge and ledge habitats not always readily accessible.

A summary table for Kent surveyed populations is given at the end of this account. It will be seen that there are considerable fluctuations from year to year, with a low of 73 (1997) and an exceptional high of 1,120 (2007). The average from 1997 to 2020 was 369 plants, affected by three very plentiful years: 2005, 2007 and 2020. Even before the bonanza years, when 195 plants were seen in 2004 in eight locations, this was far more than had been recognised before systematic survey and was regarded as a cause for celebration, with the majority of individuals occurring on National Trust properties where sympathetic management programmes were in place (i.e. scrub reduction and *Brachypodium* control) and the remainder growing immediately adjacent to these[529]. The large counts, together with increases seen in the Isle of Wight populations, however, have resulted in the down-grading of the species' threat status from Endangered to Vulnerable to the risk of extinction.[530] This is not to say that the threats to the Broomrape are less than they have been previously, but the annual fluctuations in numbers, presumably climate-related, may obscure the longer-term vulnerability. Continuing on from this table, Sue Buckingham has reported in July 2022 from the KIngsdown site a total of 235 plants on the old firing range and at least a further 60-100 on the cliffs above.

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[527] FitzGerald, R. (January 1988), *Orobanche loricata* Reichenb Oxtongue Broomrape (unpublished NCC report).

[528] The standard account for this species was in Rumsey, F.J. & Jury, S.L. (1991). An Account of *Orobanche* L. in Britain and Ireland. *Watsonia* **18:** 257-295. But there is a wealth of data and comment in Rumsey, F.J. (2015). *Orobanche picridis* F.W. Schultz in Kent: Annual Survey 2015 (unpublished report). And the principal study must now be regarded as Rumsey, F.J. & Thorogood, C.J. (2023). The shifting ecology and distribution of one of Britain's rarest plants:*Orobanche picridis* (Orobanchaceae) *British & Irish Botany* **5(3):** 303-319.

Fred Rumsey's assessment of survey results for 2020 is as follows:

> The figures for this year are obviously flattered by the amazing population explosion in the ruderal rich grassland between the Dover Patrol to Kingsdown trackside and Bockhill Farm fields. The vegetation here is in a word – scruffy, but the open herb-rich grassland provides a perfect host environment for both *O. picridis* and *O. minor*.
>
> The absence of the species now from the lower section of the Dover Trackway, other than on the cliff top at its seaward side, is, I believe, largely just a reflection of the current absence of its host. I had expressed concern several years ago that the trackway was becoming overgrown and scrubby to the plant's detriment. Now we have a low denser calcareous grassland turf which is still not optimal for the rather ruderal host. Plant numbers in the Dover area while much lower than in the past have not declined to a critical level. T he fewer plants may be larger and more productive than the small and somewhat stunted if numerous examples once present on the trackway.
>
> Coarser vegetation on cliff tops and over their brinks has lowered population counts at the western end of the Dover range. Visitor pressure at particular viewing points may have increased. Where previously some footfall may have kept these sites open and suitable, too much is not conducive to the plant's survival. Fencing etc. may be directing visitors creating compacted bare areas, while leaving protected areas to become more overgrown.[531]

Dover Docks habitat. Photo by Fred Rumsey, from 2015 survey report

There have probably been four types of threat involved: over-collection; trampling; plant succession resulting in unsuitable habitat for both host and Broomrape; and cliff erosion.

Over-collection now belongs to the past, but was probably a real issue for this rarity in the days of private herbaria. Lousley, in *Wild Flowers of Chalk and Limestone* (1950) referred to cliff falls threatening plants, but also 'Fortunately there are times (as in 1939) when they are quite inaccessible, and these give them a breathing space to recover from periods when it can be reached and picked'.

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[529] Chandler, P. (2005). Oxtongue Broomrape *Orobanche picridis* in the Dover area. *Kent Field Club newsletter* **61**:1.

[530] Stroh, P.A. et al. (2014) *A Vascular Plant Red List for England*, Botanical Society of Britain and Ireland, Bristol. As updated.

[531] Rumsey, F. (March 2021), Oxtongue Broomrape (*Orobanche picridis* F.W. Schultz) in the British Isles; an historical appraisal and survey with recommendations for conservation management (unpublished report)

Trampling is not an issue for most plants, although the Broomrape has occurred under the rise of an old step on a well-used path and scramblers could affect a grassy section of undercliff with access from beach level. There are both negative and positive aspects, given that trampling and scrambling can assist in keeping ground open so as to prevent succession and permit colonisation by the host plant, *Picris hieracioides*.

Plant succession is a material threat. Rosemary FitzGerald considered that cliff top grassland and undercliffs at least near Dover Docks had become more rank and overgrown. Fred Rumsey recognises plant succession as having affected the suitability of the trackway above the Docks for *Picris* where a large population of *Orobanche picridis* existed in association in the 1990s. He remarks also on the growth of trees against the undercliff at St. Margaret's Bay casting shade on the cliff ledges, and *Clematis*, etc. spreading so as to reduce the open area: factors greatly reducing suitable habitat. The top of the cliffs above, accessed through the Leas, has also become overgrown (no plants observed 2015-16, one in 2020).

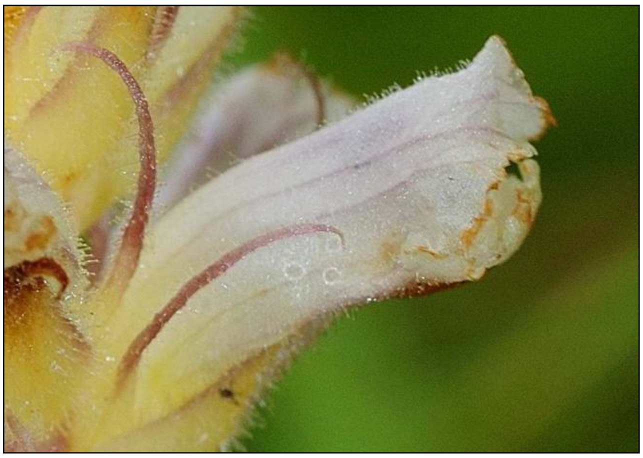
Dover Docks trackway habitat, beginning to scrub up, grass thickening. Photo by Fred Rumsey, from 2015 survey report.

Cliff erosion has resulted in the loss of many cliff edge sites during the survey period, without necessarily creating fresh habitat which both host plant and Broomrape may be able to colonise. The balance between stability and instability providing suitable habitat appears to be a fine one. *Picris hieracioides* is biennial or perennial; but *Orobanche picridis* is annual and so needs to re-establish each year. This annual hurdle is presumably a factor in the wide variation in population counts from year to year. The broomrape appears to be out-breeding and seed-set is typically poor, which compounds the problems of survival.

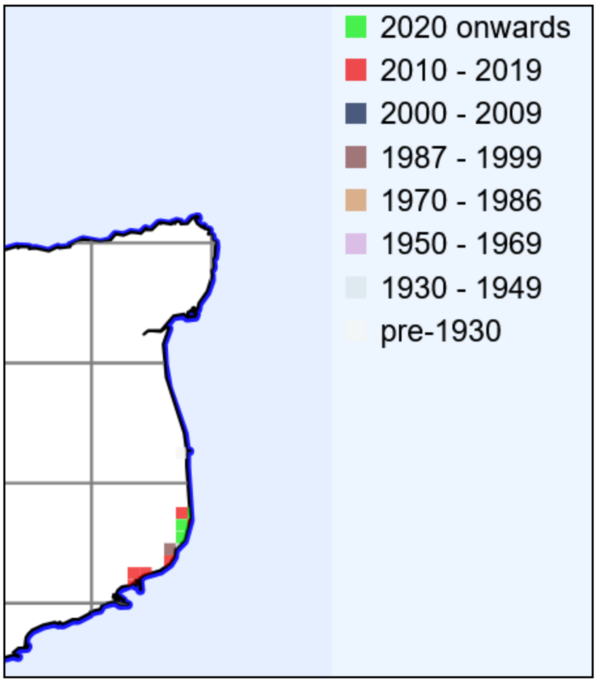
What is suitable habitat for *Orobanche picridis* in conjunction with its host is best illustrated by persistent populations which indicate that the Broomrape grows best on sunny south-facing, exposed sites, such as ledges with shallow soils, cliff edges or steeply sloping upper cliff terrain, where plant succession is inhibited by exposure, drought and heat-stress and a degree of disturbance. It is Britain's most heat-loving broomrape and the last to begin flowering (sometimes in Kent well into August). Some adaptability is indicated by changes in the Kingsdown population since 2004, where numbers have diminished on the ledges of the slumped east-facing cliff and have increased on the consolidated shingle below as this has begun to develop vegetative cover. Occasional plants can occur as colonists away from the main cliff edge sites, e.g. the discovery in 2002 of a singleton near the entry toll booth for the White Ciffs National Trust car park, and another in 2020 on an embankment of the upper tier of the car park.

Kingsdown, slumped cliff habitat. Photo by Fred Rumsey, 2007

Orobanche picridis is related to the common and variable *Orobanche minor* (Common Broomrape) and their distinguishing characters overlap. Both species grow in company as well as separately in the same general area and apparently intermediate plants have occurred on tracksides around Hope Bay, Kingsdown, but molecular investigation has not provided evidence of introgression or hybridisation. *Orobanche picridis* is (before going over flowering and quickly turning brown) a pale ivory colour overall, often tinged purplish, with stigmas of an intense dark purple. The calyx segments are all more filiform than those of *O. minor*; the bracts are longer and may exceed the corolla (which those of *O. minor* do not); the corolla is longer, with a slightly more upwardly directed upper lip; the filaments have long, white hairs (glabrous or sparsely hairy in *O. minor*) and are inserted somewhat higher in the corolla tube (3-5mm) than normal with *O. minor* (2-3.5mm). *Orobanche minor* is able to parasitise a considerable range of species (although it has varieties which have adapted to particular hosts): *Orobanche picridis* is virtually confined to *Picris hieracioides,* but at St. Margaret's, there is a record on *Pilosella officinarum* (Mouse-ear-hawkweed). Also, near Hope Point several examples of late-flowering but somewhat atypical plants which are likely to be *Orobanche picridis* were found in 2020 apparently hosted by *Inula conyzae* (Ploughman's-spikenard).



Dover Photo by Lliam Rooney, 12 July 2010



***Orobanche picridis* Kent records to 2024 mapped at monad level, from BSBI database.**

Summary of survey data (1997-2020)

[Where not searched for, this is indicated by: -]

Locality	**1997**	**1999**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2012**	**2015**	**2016**	**2020**
A2 Embankment	-	-	12	2	2	2	3	1	2	0	3	1	0	1	3
West of A2	-	-	-	-	-	0	17	5	5	1	0	1	11	1	6
Under A2 cliff top TR 33074 41833	-	2	1	14	9	8	30	7	12	13	6	18	4	15	5
Dover cliff tops TR 3316(to 3330) 4192 (to 4199)	10	13	14	9	6	4	33	11	9	1	0	6	0	2	0
Ramp above Tramway	0	2	3	5	1	7	6	0	0	3	0	4	0	1	2
Tramway	62	126	94	259	48	53	57	32	24	3	46	41	2	22	13
Ramp end to Railings			7	38	5	3	23	-	15	0	0	12	9	11	17
TR 3406 (to 8)-4231 (to 2)		49	18	2	1	12	36	-	12	7	2	25	4	3	11
By paths TR 332 419									3	0	1	1	4	1	3
NT White Cliffs Booth TR 33348 42125				1	0	0	0	0	0	0	0	0	0	0	0
NT White Cliffs upper car park															1
Dover Total	**72**	**193**	**149**	**330**	**72**	**89**	**205**	**56**	**82**	**28**	**58**	**109**	**34**	**57**	**61**
Lighthouse Down, St. Margaret's		6	1				14	0	19	1	0	9	5	1	5
St. Margaret's Bay & the Leas	1	7	10	4	1	0	0	5	3	3	3	2	0	0	1
Undercliff east of bay	-	-	-	-	-	-	-	-	15	3	-	11	-	-	-
St. Margaret's Bay Total	**1**	**13**	**11**	**4**	**1**	**8**	**14**	**5**	**37**	**7**	**3**	**22**	**5**	**1**	**6**
The Cut TR 3752 4541		18	21	22	1	8	42	10	16	6	0	11	9	15	16
Hope Point area	-	-	-	-	-		14	6	43 (+8?)	11	11	43 (+5?)	23	24	722
Kingsdown – Cliff tops TR 3800 (to 3803) 4680 (to 4699)	-	-	-	-	-	19	124		239	20	23	55	18	97	93
Slope to range entrance TR 37989 47752	-	-	-	-	-	10	45		41	18	8	8	3	0	2
Range TR3802 (to 3807) 4758 (to 4717)	-	-	-	-	-	69	407		662	95	185	136	100	54	134
Dover Patrol to Kingsdown Total	-	18	21	22	1	**98**	**632**	**68**	**1001**	**150**	**227**	**253**	**153**	**190**	**967**
Kent Total	**73**	**224**	**181**	**356**	**74**	**195**	**851**	**129**	**1120**	**185**	**288**	**384**	**192**	**248**	**1034**

Orobanche rapum-genistae Thuill. (Greater Broomrape)

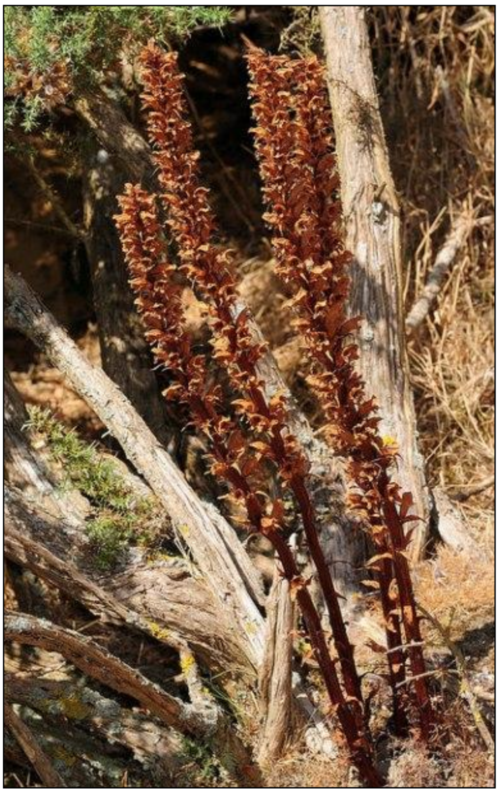
vc 15; gone from vc16

Rarity / scarcity status

Orobanche rapum-genistae is widespread but local in the British Isles, extending as far north as south Scotland, but most frequent in Wales and south west England, growing as a parasite mainly on *Ulex europaeus* (Gorse) and *Cytisus scoparius* (Broom). Its conservation risk status is **Near Threatened** in Great Britain as a whole, but **Vulnerable** to the risk of extinction in England, its area of occupancy in England having declined by 41% in comparing records for the periods 1930-69 and 1987-99. While it is **nationally scarce**, its limitation to one site in Kent renders it very **rare** in the county. It is a Kent axiophyte and so is indicative of good habitat.

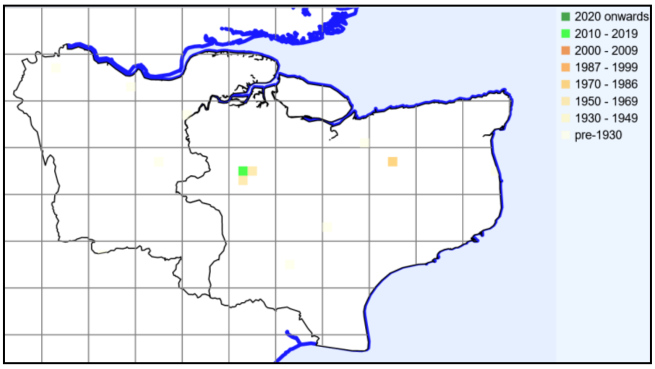
Account

The first published Kent record for Greater Broomrape is by John Gerard in his *Herball* (1597): 'The Broome Rape is not to be found but where Broome doth grow; it growth in a Broome fielde at the foote of Shooters hill next to London… and divers other places'. This appears to be the only British broomrape recognized at the time, and hence the association of the name with broom (*Rapum genistae*, the turnip-root of broom, according to Gerard) rather than the range of species with which *Orobanche minor* (Common Broomrape) is associated. The latter species was not recognised in Kent (and, indeed, the British Isles) until 1724, which is likely be related to its repeated introduction with fodder crops; and *Orobanche rapum-genistae* would have been the common broomrape, in Kent and elsewhere, before then.



Eyhorne Street. Photo by Lliam Rooney, 24 July 2013

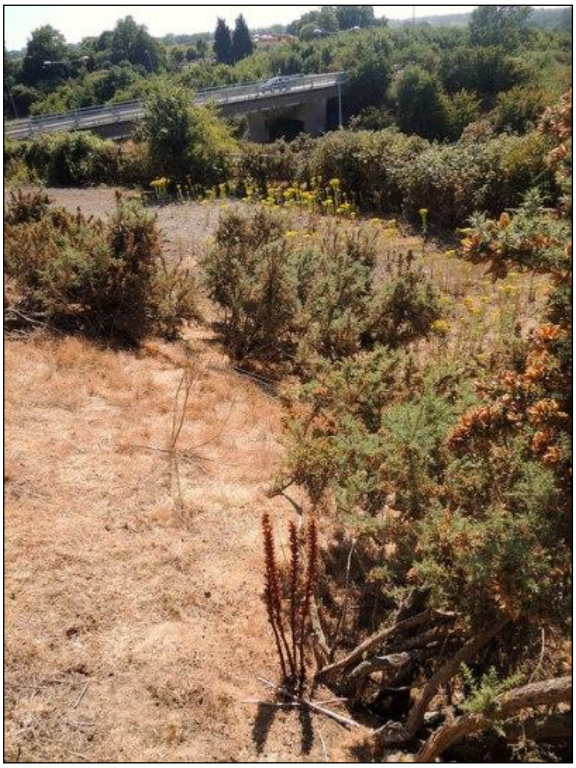
Most of the early records cited by Hanbury & Marshall (1899) are probably occurrences on sandy or gravelly ground, where Broom is most likely to grow; and sometimes the presence of Broom is explicitly recorded, e.g. T.H.M. Bartlett's find of 'Orobanche major, *on broom*' at Covert Wood (given in M.H. Cowell's *A Floral Guide for East Kent*, 1839) and Thomas Forster's record 'In bushy places where Broom grows, not uncommon' (*Flora Tonbrigensis*, 1816). Hanbury and Marshall considered it to be local in the county, growing on 'Heaths, etc. on Broom and Furze'.



***Orobanche rapum-genistae* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Francis Rose's assessment was 'Parasitic on *Sarothamnus* [now *Cytisus*] *scoparius*, more recently on *Ulex europaeus*: formerly not uncommon, now very rare in a few bushy places and woodland rides'. The species had long since ceased to be found on the north west Kent gravels, and he recognised it as in five areas in East Kent. One was a gravel pit at Swanton Farm, Littlebourne (1956, which is likely to be the current Court Hill transmitter site at TR 203 591, a former *Lotus* *angustissimus* (Slender Bird's-foot-trefoil) location, which has changed considerably. Another was at West Wood, Stowting, TR 137424, on Broom in a ride on Pliocene sand (1958). It was also present at the edge of Bourne Wood, Orlestone (Hamstreet) in 1946 and, not far away, in a ride at the south end of Horns Wood, Ruckinge (probably TR0334) in 1957-58. Perhaps the best location was on a heathy ridge on Folkestone Sand north of the A20, a mile [south] west of Hollingbourne, where it grew on Broom and Gorse from 1951 to 1962, with about 100 spikes present in 1951.

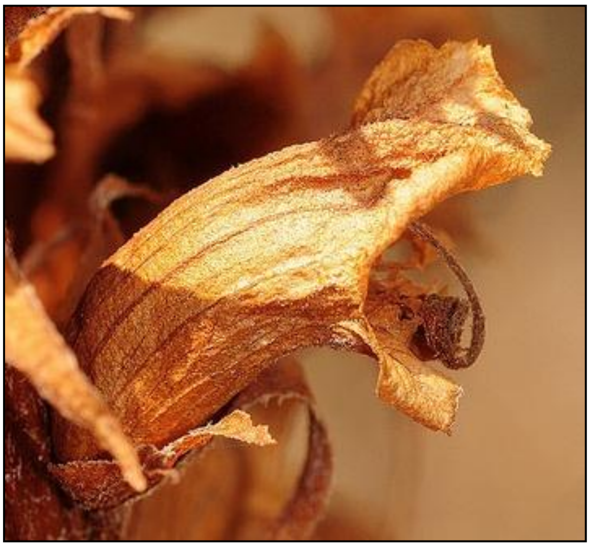
After the 1950s-60s, the species seems to have become very rare in Kent. For 1971-80, Philp (1982) gives only two sites: Eyhorne Street and Canterbury. The latter site (TR15U) is probably TR1758, which looks to be the location reported by John Kesby in 1976 ('Canterbury golf course, dry sandy plateau at edge of woodland, and with abundant Broom'); it may have a similar geology to the Littlebourne site, about 2.5km away. There are a handful of other reports in the 1980s and 1990s: one in scrub near Bewlbridge reservoir in 1984, on Broom; another in 1999 in a chestnut coppice clearing at Milstead Woods, Torrey Hill estate (TQ95E) where shown to Joyce Pitt, parasitic on Broom; and another on waste ground west of Westbere School, presumably TR1961; but the only persistent site is at Eyhorne Street, a sandy bank on the Folkestone Formation.



Eyhorne Street, habitat. Photo by Lliam Rooney, 24 July 2013

This location was mentioned in Philp (2010) as carrying a few plants in most years and it remains the only current site. The sandy bank on the Folkestone Formation was possibly created as part of the Maidstone bypass works around 1960 and was severely affected by the construction of the junction 8 to 9 section of the M20, which opened in 1991 (access to a working site was taken along the bank). The roadworks may, however, have been to a degree beneficial as creating a bare sand surface on which plant succession is very slow, because of heat and drought stress over summer. *Ulex europaeus* grows here in quantity, and acts as host plant for the Broomrape. Our most detailed survey information comes from Alfred Gay, Owen Leyshon and Lliam Rooney on 24 July 2013, when 36 spikes were recorded. Five of these were at TQ 82402 54635; 23 were at TQ 82406 54686; and groups of two each at TQ 82410 54688, TQ 82418 54652, TQ 82402 54690 and TQ 82403 54692. In 2018 there were 24 spikes (Owen Leyshon). There have been no reports since.

Orobanche rapum-genistae is a tall, robust yellowish red-brown broomrape, usually over 40cm high but known up to 90cm. It has yellow stigma lobes and the filaments are glabrous in their basal third and are attached to the corolla tube at no more than 2mm from the tube's base.



Eyhorne Street. Photo by Lliam Rooney, 24 July 2013

Osmunda regalis L. (Royal Fern)

vc 15 and 16

Rarity / scarcity status

Royal Fern is widespread in the British Isles, principally in the wetter western parts, but extending into the Sussex Weald. Its threat status in England and in Great Britain as a whole is one of 'Least Concern'. In Kent, it is at the edge of its range and is **scarce**. It is a Kent axiophyte and so is indicative of good habitat.
'//

Account

There is evidence of the early occurrence of Royal Fern through the presence of spores in pollen samples of what was presumably fen carr vegetation near Chapel Bank, Shirley Moor, especially during 5800-3600BP, after which peat formation slowed and eventually ceased. Turning to historical records, several sources place the earliest Kent records at Woolwich. Philip Miller's *Botanicum Officinale* (1722) says 'It grows in marshy boggy Places, particularly in a Bog at the backside of *Woolwich*, near the Warren'. Dillenius in his third edition of John Ray's *Synopsis Methodica Stirpium Britannicarum* (1724) included an observation of Royal Fern at Woolwich heath by Samuel Doody (died 1706). Also, Christopher Merret (died 1695) wrote – according to Hanbury & Marshall (1899) – a marginal note in his own copy of his *Pinax rerum naturalium Britannicarum* (1666) that it grew 'in y^{e} bogs nigh to y^{e} windmill by Woolwich'.

Orlestone Forest. Photo by Alfred Gay, 15 October 2017

By the time of Hanbury & Marshall (1899) it was regarded as a plant of boggy heaths and copses, but rare, 'eradicated in most of its stations'. This eradication is associated with the pteridomania of the mid-nineteenth century, when a widespread obsession with ferns gave wild plants commercial value. *Osmunda regalis* was at particular risk, as it had potential as a striking garden or conservatory plant, but also the fibrous roots were broken up and, called osmunda fibre, were used as a growing medium for epiphytic orchids. Both amateur collection for the garden and wholesale collection for commercial sale are illustrated in the biography of Benjamin Harrison of Ightham[532]: Harrison made

> 'a fern-collecting expedition to the moorland of Rose Wood, a couple of miles south-west of Ightham. The area was in 1854 an almost impenetrable bog, and he described how, in his search for ferns, he jumped from stub to stub in his efforts to avoid plunging into the moorland pools. Amongst other trophies he brought home specimens of *osmunda regalis*, one of which he replanted in his garden, where it still survives. Harrison stated that in the middle of the nineteenth century the hollow sandy lanes around his home were draped with ferns… Shortly afterwards, collectors for Covent Garden market invaded the district and stripped the banks of nearly all their choice ferns and plants; and except in a few protected spots, the countryside became almost fernless'.

Neither the habitat nor the *Osmunda* exists there now, but this sounds very much a native occurrence.

Re-colonisation by *Osmunda* was recognized by the 1940s and 1950s but, as Francis Rose mentioned, one cannot be sure whether large plants in natural-looking sites, such as wet cars, acid bogs and pond margins, especially in former estate grounds, are relict natives; survivors or descendants of old plantings; or recent invaders through the spread of spores. He considered that the most likely natural sites were in boggy woods (the fern being moderately shade-tolerant), and the possibly natural re-invasions of damp walls and rocks, especially around Tunbridge Wells. He noted that there were plants in the south eastern corner of the lower pond at Keston Common from 1947 onwards and that Hanbury & Marshall (1899) had drawn attention to its occurrence at Keston heath vouched by Edward Newman (*A history of British ferns*, 1840), while supposing it no longer to be present in 1899. As it was still there in the 1980s, there is a question as to how far there has been continuity since 1840 in view of widespread fern theft in Victorian times, the failure of the species to form a viable spore bank, and the intervention of planting on the Ravensbourne estate. Philp (1982) recognised the fern as persisting and reproducing itself in a few damp areas on more acid soils, giving seven tetrad records in the south west of the county for the period 1971-80, most near the Sussex border. In Philp (2010), the number of tetrads had reduced to four, with a note as to it being open to debate whether the plants were truly native or a result of being originally planted.

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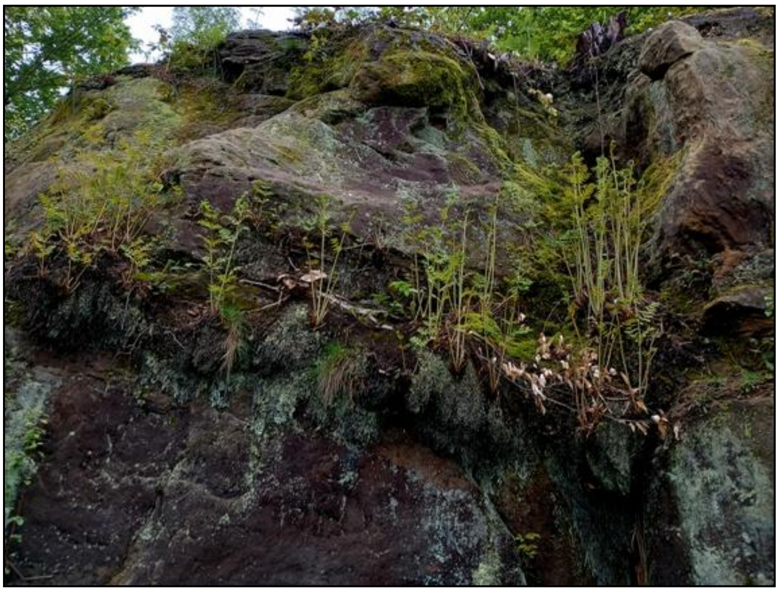
[532] Sir Edward Harrison (1928). *Harrison of Ightham*, O.U.P.

Records for the period 2010-24 exceed this, with eight tetrads (from the same number of monads), although one metropolitan West Kent record needs a better understanding of status: only one tetrad is the same as in Philp (2010). The recent records well illustrate the difficulties of judging whether wild plants are involved, whether of native stock or re-colonising back from gardens:

- Brabourne Lees. Five crowns by alder carr, with various plantings of ferns and other plants naturalising in the boggy ground adjoining garden. Likely to have been planted, established but without further spread.
- Bedgebury pinetum. Origin uncertain, but known at the pinetum, at least 1947-54, after which considered frequent in a boggy valley at the pinetum, which was later affected by drainage works, leaving the occasional plant in ditches in the wider Bedgebury Forest[533], suggestive of possible native status. A 2018 find related to what had been a small landscaped pond and so its presence may be associated with human intervention.



Rusthall Common. Photo by Geoffrey Kitchener, 2 May 2024

- Rusthall Common. Present on rock face on common land at least since 1949. Not recognized here in the early Tonbridge/TunbridgeWells Floras, albeit that Newman's *History of British ferns* (1840) refers to the species as present in the neighbourhood of Tunbridge Wells. Likely to have originally been introduced or to have spread from gardens. Many plants of all sizes growing on a rock face, some massive with rootstock extending along ledges, clearly reproducing in situ in the wild.

- Orlestone Forest (two tetrads). A large plant 2-3 metres across, hollowed in the middle, indicative of considerable age; in pond system at Bayland Wood which appears to go back well into the nineteenth century (2017-21). Also nine plants, and some dead rhizomes, around a pond margin in Birchett Wood (2019). There is a history of the species at Longrope Wood (part of the same complex) probably going back to the 1950s, but Francis Rose's Flora, before revision, said 'reputedly planted'; the withdrawal of that comment from the revised version may have meant uncertainty, or a view that it did not really matter. However, these are perhaps the best current (post 2010) examples of possible origin from native stock.

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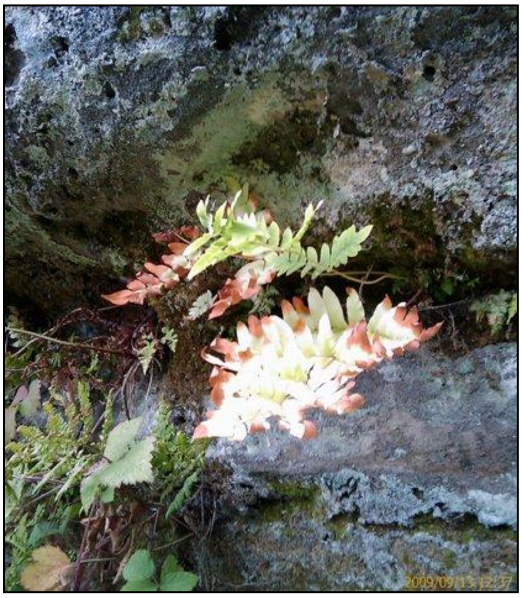
[533] Pitt, J. 2000. *Vascular Plants*, in Waite, A (ed.) *The Kent red data book: a provisional guide to the rare and threatened flora and fauna of Kent*. Kent County Council.

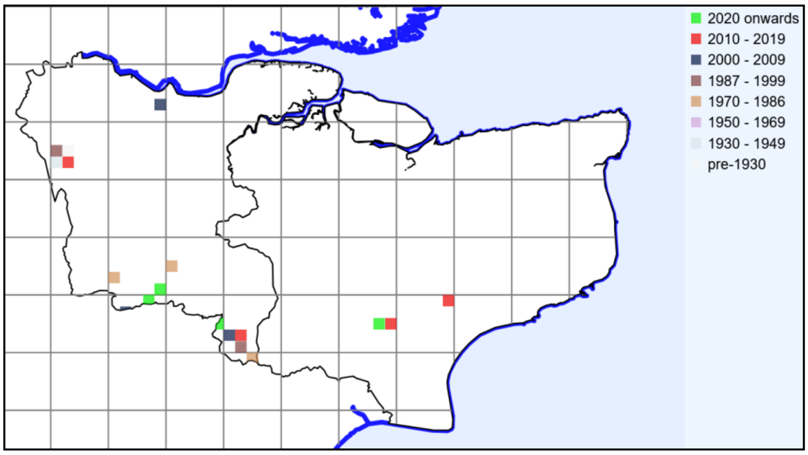
Orlestone Forest. Photo by Sue Buckingham, 22 October 201

- Kilndown. Two small plants with fertile fronds recorded in 2020 at the edge of a woodland ride appear to be different plants from two found in a similar situation in 2004. Both sightings, however, are within 750m of the lake/moat surrounding mediaeval Scotney Castle (in vc14, East Sussex), where the fern is abundant and gives the impression of having been originally planted. It is likely that these planted specimens are the source of those which have established themselves in the neighbouring (vc16, West Kent) woodland.



It is possible that spores from Rusthall Common account for a young plant on a similar sandrock outcrop less than 1.3km away on Tunbridge Wells Common seen in 2009, although one cannot rule out that it might also been grown in a garden within that range. The ability of the fern to colonise appropriate niches in the Tunbridge Wells area is also illustrated by its long-term presence on the sandstone cutting north of the railway tunnel London-wards of Tunbridge Wells Central Station Establishment from spores would require rapid germination since *Osmunda regalis* is a green spore species with very limited spore longevity, measured in weeks.

Tunbridge Wells Common. Photo by Philip Sansum, 13 September 2009



***Osmunda regalis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The large size of the mature fronds, their coarse cut and the absence of sori underneath (spores are carried in sporangia clustered round reduced pinnae mid-ribs at the top of the tallest fronds) make *Osmunda re*galis fairly unmistakable. However, young plants may resemble *Onoclea sensibilis* (Sensitive Fern) but have veins on the pinnae which fork to the margin; those of *Onoclea* are netted.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Keston Common (metropolitan vc16)	TQ4164	SSSI	(1) 8 August 1987 (2) 1987 (3) 21 September 1986 (4) 17 June 1978	(1) RMB (2) & (3) JP (3) LNHS	(1) TQ 418 645. (2) SW corner of lower pond, TQ 418 641. (3) TQ 415 643, clump at southern end of middle lake in peaty ground. (4) TQ 4181 6415, SW corner of lower pond, 2 plants. [Formerly also Keston Bog. There are also many records for Ravensbourne meadows over a long period, where generally recognised as former estate plantings or naturalised from them, including the occasional small plant.
Holwood Park (metropolitan vc16)	TQ4163		17 July 2016	MC	Given as in parkland, but no indication of status. [It is an 18th/19th century landscaped park with many plantings. *Osmunda* probably one of them and recorded here at intervals from 1948 (when in a swampy pool in the north east part of the park with *Menyanthes* and considered by FR to be possibly relict here in part)].
Chevening Park	TQ4857		1982	RMB	TQ 4899 5747, in lake outflow stream. [Presumably derived from estate planting; RMB recorded a planted specimen in 1978 at TQ 489 577.]
Burrswood Estate, Groombridge	TQ5137		4 August 2007	KFC meeting, comm. JP.	TQ 5173 3782, ditch at edge of ride in linear woodland (Burrswood), 'appeared genuinely native' (IB in Kent Field Club Bulletin (2008) **53**: 32).
Tunbridge Wells	TQ5538		11 June 2005	BPS meeting	Tea Garden Farm, Tunbridge Wells Sandstone. *BPS Bulletin* 6(4): 296. [Not found, 2018, SL.]
Rusthall Common	TQ5639	Managed by Tunbridge Wells Commons Conservators	(1) 2 May 2024 (2) 20 May 2017 (3) 25 May 2011 (4) After 1970, before 1981	(1) GK & DC (2) SL & KFC meeting (3) GK (4) Philp (1982)	(1) Rusthall Common at TQ 56675 39614, vertical sandstone outcrop facing north to Apsley Street, the main colony being c.3.3m wide, the plants appearing from massive and continuous rootstock across that width and also ascending c.2m into a vertical cleft. There were smaller associated plants forming a line along a stratum a little above the eastern end of the main colony (with a singleton further above), and two more nearby to the east.

					Further small plants were present at TQ 56666 39624, TQ 56662 39624 and TQ 56660 39626, but one with its rootstock had slipped down with the detachment of a sandstone fragment. Associated plants were few, the rock face being mainly bare, but included *Dryopteris dilatata, Deschampsia flexuosa* and *Betula pubescens*. Conservation work had recently cleared much tree growth. (2) TQ 56671 39617 to TQ 56662 39628, Rusthall Common, north east facing rock face opposite housing along Apsley Street. Many plants growing along rock face, ranging from tiny to tall/robust with larger plants 10 foot high on sandy/peat. Most plants followed certain lines of strata/bedding planes along rock face. (3) Along north-facing sandstone vertical faces, at north side of Rusthall Common near Denny Bottom, where the rocks arc round a valley with cottages lacking road access, TQ 5672 3950 (or TQ 5665 3963 according to different measure) to TQ 5666 3962. One main colony with at least 12 large plants around cleft; a couple of young plants 5m west; and three more young ones 10m further on. (4) Tetrad map only given.
TunbridgeWells Common	TQ5739	Managed by Tunbridge Wells Commons Conservators	13 September 2009	PS	TQ 5791 3938, a single small plant in bedding plane of sandrock outcrop below Mount Ephraim.
TunbridgeWells Common	TQ53U		(1) After 1989, before 2000 (2) After 1970, before 1981	(1) EGP (Philp, 2010) (2) Philp (1982)	(1) & (2) [Probably TQ5639]
Tunbridge Wells	TQ5840	Railway land	2023	TL	TQ586400. On steep sandstone faces of railway cutting as line emerges northwards from tunnel north of Tunbridge Wells startion, well south of Grosvenor Bridge. Most on west side of tracks, including large plants. Seen from train and known to recorder for upwards of 25 years.
Stonewall Park	TQ54B	Private estate	August 1974	HP in Philp (1982)	[This is parkland with a stream valley and estate plantings.]
High Brooms area	TQ54V		After 1970, before 1981	Philp (1982)	
Scotney / Kilndown area]	TQ63X		(1) 5 May 2005 (2) After 1970, before 1981	(1) EGP & DG (Philp, 2010) (2) Philp (1982)	[Philp (1982, 2010) covered the administrative county of Kent and so would have included Scotney, where the fern has been cultivated

					and spread within the area of cultivation. But the 2005 record appears likely to have been a wild plant in TQ6935, in vc16 - see below.]
Kilndown Wood	TQ6935		(1) 1 July 2020 (2) 16 September 2004	(1) DCh (2) JP	(1) TQ 697 353, Two small plants with fertile fronds at edge of woodland ride. (2) Two plants in ride at TQ 69493 34694.
Kilndown	TQ7035		4 September 1990	FR	By ride.
South east of Tonbridge	TQ64C		After 1970, before 1981	Philp (1982)	
South west of Hawkhurst	TQ72P		After 1970, before 1981	Philp (1982)	
The Moor, Hawkhurst	TQ7629	KWT managed reserve	1984	JP	Collingwood nature reserve, TQ 760 292. [Part of Collingwood estate which had been planted up with exotic species, perhaps including the *Osmunda*.]
Bedgebury / Combwell area	TQ73B		(1) 24 July 2002 (2) After 1970, before 1981	(1) EGP (Philp, 2010) (2) Philp (1982)	(1) & (2) TQ73B. [Formerly frequent in a boggy valley in the pinetum, according to JP, but pond construction since rendered the valley floodplain very dry.]
Bedgebury pinetum	TQ7233	Forestry Commission owned and managed	(1) 12 May 2018 (2) 10 August 2011	(1) SL (2) SB & KBRG meeting	(1) Bedgebury Pinetum, edge of small landscaped pond incoporated into stream, c. TQ 7226 3353. Two very large/old plants. (2) TQ 72329 33548, origin uncertain. [Also known to JP along a ditch on the south side of a track, TQ 726 332(-4).]
Bedgebury / Flimwell area	TQ73F		After 1989, before 1999	Philp (2010)	
Bedgebury Forest	TQ7330	Access land	(1) 2 July 1999 (2) 9 May 1999 (3) 26 August 1986	(1), (2) JP, JW (3) JP	(1)-(3) TQ 735 330, along ditch on south side of east-west track.
Hemsted Forest	TQ8136		23 August 2009	RM	TQ 8199 3623, small plant.
Knockwood, Tenterden	TQ8935	Access land	20 September 1992	JP & JW	TQ 896 353. Recorded in this wood, possibly inaccurately, as TQ8934, for 1956 when considered by FR as here being ‘possibly native’ (MS Flora) or ‘almost certainly native’ (**MNE** specimen).
Orlestone Forest	TQ9735	Access land	(1) 20 Aug 2021 (2) 27 August 2018 (3) 8 April 2018 (4) 15 October 2017	(1) KBRG meeting (2) OL (3) KFC meeting (4) AG	(1) Bayland Wood TQ 9766 3593. Same plant still present on island in shaded woodland pool which this wet summer had plenty of water. (2) Still present at TQ 97678 35908, Bayland Wood, part of Orlestone Wood, in old pond (dried up). (3) TQ 9766 3593. Same plant as discovered last year, showing only dead fronds, isolated on island in pond and inaccessible due to high water level. (4) TQ 9766 3593, a single large plant in a dried up peaty pool at the edge of *Carpinus betulus* woodland. Visited by SB on 22

					October 2017, noting associated plants: *Hottonia palustris, Solanum dulcamara*, *Galium palustre*, *Urtica dioic*a. The plant was 2-3 metres across but made up of a ring of eight individual tussocks with bare peat at the centre which appears to be suggestive of a great age.
Orlestone Forest	TQ9935	Access land	2 June 2019	NG	In a pond at TQ 99127 35315 on Forestry Commission land in Birchett Wood. The site was visited by SB on 17 September 2019 when nine plants were counted in three locations around the pond margin: six at TQ 99091 35311, two at TQ 99090 35316 and one at TQ 99079 35320. Pond well lit as a result of clearance of spruce trees in 2017 (some shade from birch, etc.). A number of old apparently dead rhizomes around the margin suggest the plants have been there for some time.
South of Brabourne Lees	TR0389		(1) 1 August 2015 (2) 24 October 2014	(1) KBRG / BPS meeting (2) GK	(1) Probably planted and now established, five crowns noted (four seen previous year, but one may have been overlooked). (2) TR 0826 3391, four crowns together in wet alderwood near other escaped/planted non-native ferns just outside garden fence boundary of Bog Farm, presumed introduced but established.

Oxalis acetosella L. (Wood-sorrel)

vc 15 and 16

Rarity / scarcity status

Wood-sorrel is common in moist shady habitats throughout the British Isles except for parts of east England where rainfall is limited to 60 to 80cm per annum. Its risk status in Great Britain as a whole has been one of 'Least Concern', but for England it was assessed in 2014 as **Near Threatened**, due to its rate of decline. Its area of occupancy in England is taken to have declined by 20% comparing records for the periods 1930-69 and 1987-99. In Kent, it appears to have declined by 30% between 1971-80 and 1991-2005. It still remains sufficiently common that it is does not qualify to be treated as either rare or scarce in the county. It is a Kent axiophyte and so is indicative of good habitat.

Upper Ensign. Photo by Lliam Rooney, 7 January 2010

Account

Oxalis acetosella is a native plant, and its seed has been found in peat excavated at Frogholt near Folkestone dating back some 3,000 years[534]. The species was first published for Kent by Thomas Johnson. On 4 August 1632 (*Descriptio Itineris,* 1632), he noted it in the course of his party's journey from Sandwich to Canterbury, probably in the woodlands bordering the road west of Littlebourne as they approached Canterbury. In terms of habitat, it is no surprise that several mosses are listed in proximity to the *Oxalis*. Johnson was then also preparing a revised edition of Gerard's *Herball*, published in 1633, in which he inserted the following comment: 'My oftmentioned friend Mr. *George Bowles* sent me some plants of this with very faire redde floures, which hee gathered in Aprill last, in a wood of Sir *Thomas Walsinghams* at Chisselhurst in Kent, called Stockwell wood, and in a little round wood thereto adjoyning'. These have been given varietal status as var. *subpurpurascente*.

Paddock Wood. Photo by David Steere, 29 April 2016

The early writers of Floras relating to parts of Kent unsurprisingly do not have much, if anything, to say about the species, other than that it was common, or very common, in woods. Hanbury & Marshall (1899) treated it as a common plant of shady banks and woods (especially beech). Francis Rose in his manuscript Flora wrote of it as a native of 'dry woods and shaded banks, on loam, sand, gravel, and more rarely on shallow chalk rendzinas; very common in all wooded districts (absent from the Hoo peninsula, Grain, Sheppey, Thanet, the Lower Stour valley, and Romney Marsh)'. Philp (1982) gave 384 tetrad records, finding it to be common in suitable habitats and hence showing the same absences as had been flagged by Francis Rose together with a distribution gap in the Low Weald, presumably again reflecting a relative lack of woodland. However, Philp (2010) gives a much more attenuated distribution with a substantial drop in the number of records, to 269 tetrads, noting that it does not appear to colonise disturbed or open ground. Whether that has bearing on the apparent decline is an open question: the species appears to be benefited by coppicing cycles, where these take place, and permanent woodland loss and/or development does not seem sufficient during that period for a decline of this extent to have arisen through a combination of such habitat loss and an inability of the species to recruit or recover via the resultant disturbed or open ground.

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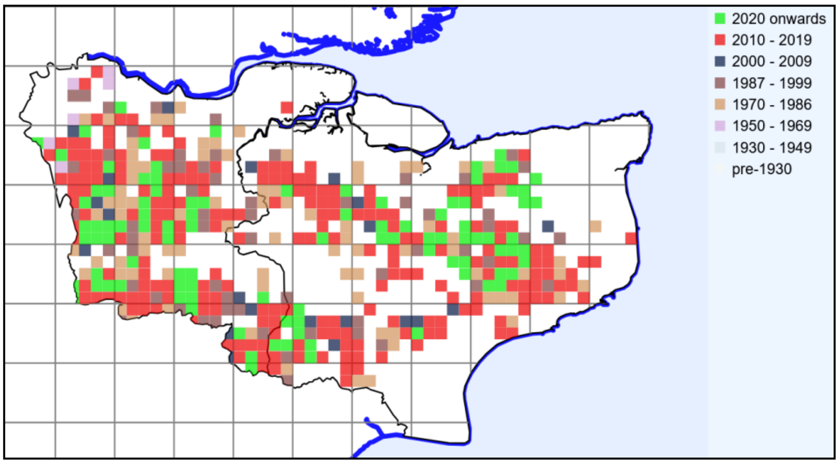
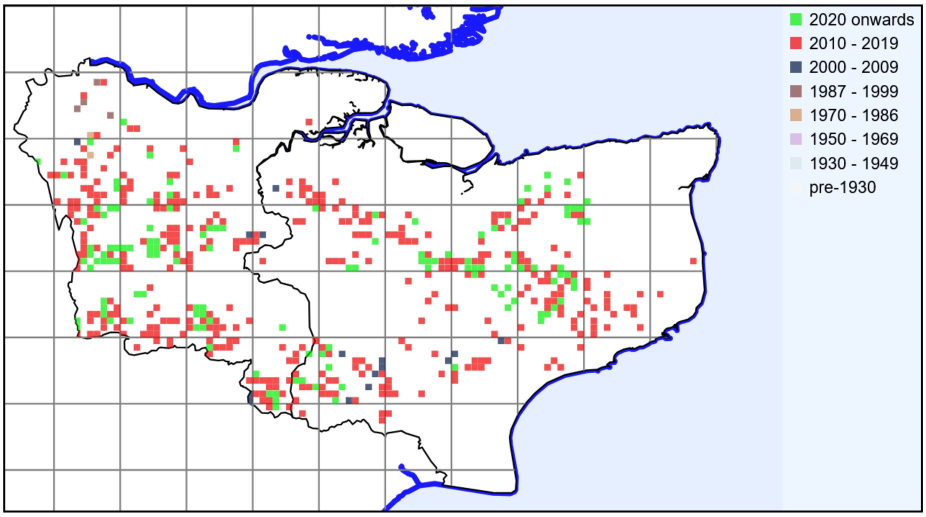
[534] H. Godwin (1962). Vegetational History of the Chalk Downs as seen at Wingham and Frogholt. *Veröffentlichungen des Geobotanischen Institutes der Eidg. Tech.*, Hochschule, Stiftung Rübel, in Zürich **37**: 83-99.

***Oxalis acetosella* Kent records to 2024 mapped at tetrad level, from BSBI database.**



The BSBI database historic tetrad records show where 1971-80 records have not been re-found (nearly all these comprise the 1970-86 pale squares on the accompanying tetrad map). It is difficult to draw conclusions from so general a scattering, other than that the position is concerning. In some cases there are blocks of squares which indicate individual woods which could be investigated for habitat change.

Current data are shown at finer resolution in the distribution map below, given at monad level, and largely excluding historic data, as monad recording did not become the norm in the county until 2010.



***Oxalis acetosella* Kent records to 2024 mapped at monad level, from BSBI database.**

Our 2010-24 records are for a total of 309 tetrads (488 monads), so that no further decline is shown from from the position given in Philp (2010). After adjusting for 25 tetrads present in Greater London, which was not surveyed for Philp (1982 and 2010), an administrative county of Kent total of 284 tetrads compares quite nearly to 269 from Philp (2010), although implying a very rapid decline in the 1980s levelling off afterwards, which is hard to explain.

Where in 2010-24 records we have noted any observations, these tend to relate to the habitat being generally woodland, sometimes ancient woodland, occasionally noted as damp. Philp (2010) gave a 1991-2005 distribution map clearly relating its presence to woodland. It is regarded as a species indicator of ancient woodland in south east England[535]. Much information regarding its ecological requirements is given in *The Biological Flora of the British Isles* account[536], which describes its growth needs.

Paddock Wood. Photo by David Steere, 29 April 2016

It grows best under light shading (27% of available light), but its optimal conditions of light and temperature suit many other species as well and it competes successfully in many of its natural habitats because it can tolerate greater shade (6% of available light) than most other plants. Although Francis Rose mentioned it as a plant of dry woods, there is evidence that it does not grow well in dry conditions (at least other than in areas of high rainfall), so it will give preference to areas of impeded drainage such as by paths, where woodland is otherwise well-draining..

Moist woodlands under moderate shade will suit, and it is able to photosythesise later into winter than most other plants; conversely, growth is affected adversely by high summer temperatures, so it might be the case that climate change bringing warmer, wetter winters and hotter, drier summers would decrease its competitiveness in both seasons, which could underlie any long term decline. The effectiveness of winter growth is indicated by the photograph at the beginning of this account, taken of a plant in flower on 7 January! Normally it is a spring flowerer (April-May), at least as far as concerns the normal, chasmogamous flowers. Most viable seed is produced by summer or early autumn by cleistogamous flowers, which do not draw attention in the same way: they tend to bury themselves in surrounding moss or leaf litter.

Habitat, Dibden, Sevenoaks. Photo by Sarah Kitchener, 5 August 2020

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[535] Rose, F. (1999). Indicators of ancient woodland, *British Wildlife* **19**: 241-251.

[536] Packham, J.R. (1978). Biological Flora of the British Isles: Oxalis acetosella L. *Journal of Ecology* **66**: 669-693.

Oxybasis chenopodioides (L.) S. Fuentes, Uotila & Borsch (*Chenopodium chenopodioides* (L.) Aellen) (Saltmarsh Goosefoot)

vc 15 and 16

Rarity / scarcity status

Saltmarsh Goosefoot is **nationally scarce**, being largely restricted to Essex, so that the Thames estuary represents its core distribution. As it has diminished in its East Anglian range and is a characteristic species of good quality coastal grazing marsh and saltmarsh, it is perhaps surprising that its conservation status in England and in Great Britain as a whole is one of 'Least Concern', but this presumably reflects a view regarding the stability of its populations. In Kent, it is not common, but is locally frequent where it does occur, and does not warrant designation for rarity or scarcity. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first Kent find of *Oxybasis chenopodioides* appears to have been by J.T.B. Syme in 1852 at Gravesend[537]. It may be conjectured that it in the distant past it may have been a feature of the tidal marshes up the Thames to London, given that its pollen has been identified in the excavation of Roman material at Finsbury Circus. The pollen may not have originated in situ, of course, and could have arrived by various means, even (per Francis Rose, perhaps somewhat fancifully, *in litt.)* with oysters, gathered by the Romans off north Kent and transported! Marshall (in the Victoria History of the County of Kent, 1908) stated that it "only grows in the Thames salt-marshes and near Sandwich"; and the assessment of Hanbury & Marshall (1899) was that it was rather rare. There are specimens from the Pegwell Bay area near Sandwich gathered from the 1850s to the 1870s, but this does not seem to have been a locality which has persisted. Thereafter, the main concentration of records appears to have been from Shorne to Grain, although Francis Rose in the 1940s to the 1960s took the distribution eastwards to the Swale. There was also an odd eastern outlier in a brackish dike north of Stuart, St Nicholas at Wade.

Uplees Marshes. Photo by Lliam Rooney, 5 October 2010

Philp (1982) for the period 1971-80 gave 21 tetrad records in the administrative county, almost all spanning the same part of the north Kent coast, and with concentrations at Grain and in south Sheppey. These records occur with greater continuity along the coast in Philp (2010), where 29 tetrad records are mapped. It is likely that the increase in records does not reflect a population increase, but rather relates to targeted recording. (The same is probably due of the coastal populations of *Oxybasis glauca* – see separate account.)

Nevertheless, there were during the survey period (1991-2005) further records not mapped in Philp (2010), arising in the course of a 1995 survey by Phil Williams[538]. of the ditches of the North Kent Marshes SSSIs, the first such comprehensive survey, and including the South Thames Estuary & Marshes SSSI, the Medway Estuary & Marshes SSSI and the Swale SSSI which together carry a drainage system of over 2,000 ditches. This survey covered *Oxybasis chenopodioides* records in 47 monads, which equate to 14 tetrads additional to the 29 tetrads given in Philp (2010). The extent of these records is such as to highlight that subsequent general recording can only be regarded as sampling. By way of illustration of the abundance of the species revealed by full survey in 1995, the accompanying map, reproduced with kind permission of Phil Williams and Natural England, shows sites recorded in the south Sheppey marshes bounded by the old counter wall.

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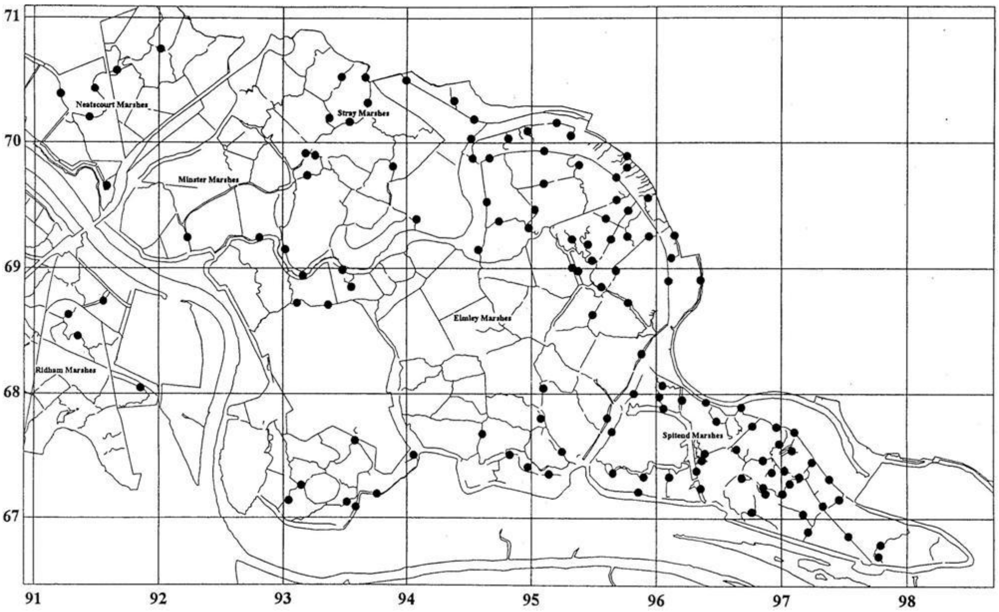
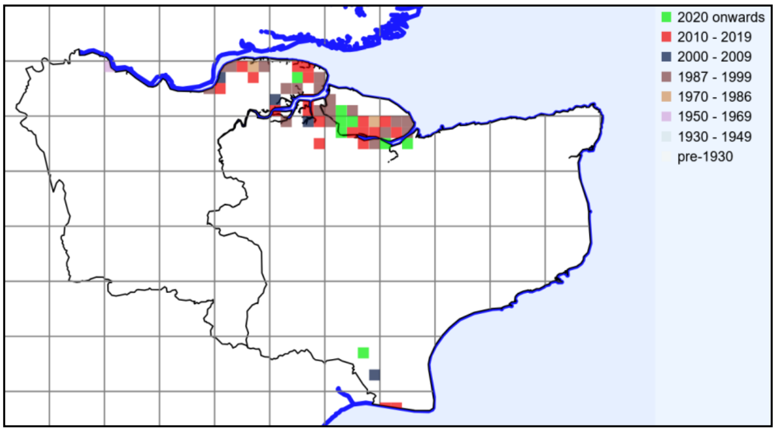
[537] Mentioned in the Botanical Exchange Club Curator's Report for 1863 (1864), reviewed in Journal of Botany (1864).

[538] Williams, P. (1996). *A survey of the ditch flora in the North Kent Marshes SSSIs, 1995*. English Nature Research reports no. 167.



Neatcourt, Minster, Stray, Elmley and Spitend Marshes, 1995

There are occasional anomalies of Kent finds away from the Thames / Swale estuaries. Francis Rose recorded the species north west of Greatstone, in saltmarsh with *Bolboschoenus maritimus*, the site of the old Rother estuary. Both Philp (1982) and (2010) give an inland Romney Marsh record at TQ96T, which represents a population at Fairfield with records from 1962 (K.D. Rowlands, near the church, TQ 966 265) onwards. (The Fairfield site is 8 km inland, but the ditches are saline, which may be associated with the unusual thinness at this point of the layer of silty clay over peat, and with the possibility of the peat substrate holding salt from historic marine transgressions[539].) There have also been sightings (2013, 2018) by the A249 near Bobbing, presumably brought down from the estuary, but least 4km from any estuarial habitat. However, these are very much exceptions to the Thames / Swale focus of this species.



***Oxybasis chenopodioides* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Our 2010-24 records have not quite reached the same coverage as obtained in Philp (2010), totalling 28 tetrads or 40 monads in comparison with 29 tetrads in the 1991-2005 survey. It is quite possible that this is a matter of underrecording, as many locations are remote of access and need to be visited at the right time of year. Not every year is suitable for this species: weather conditions in 2012 were not conducive, as summer and autumn rainfall kept water levels in ditches above where Saltmarsh Goosefoot would normally be growing.

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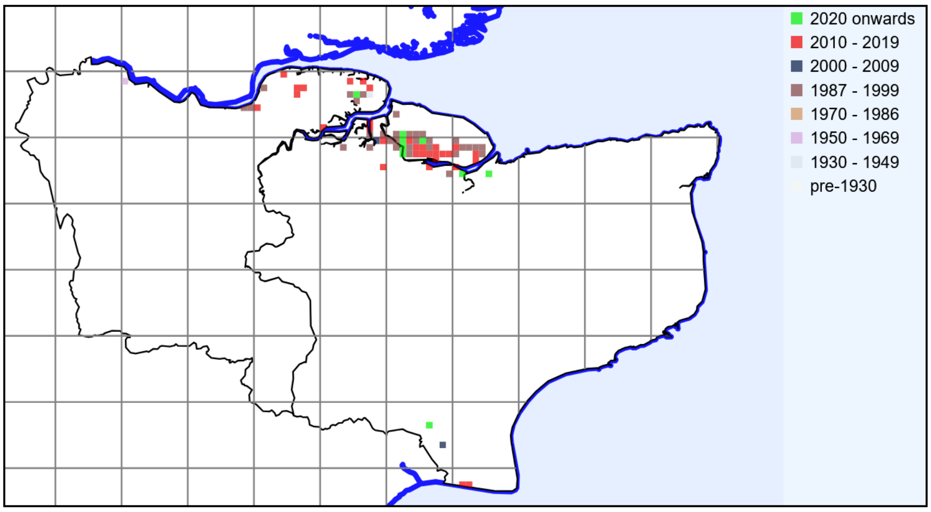
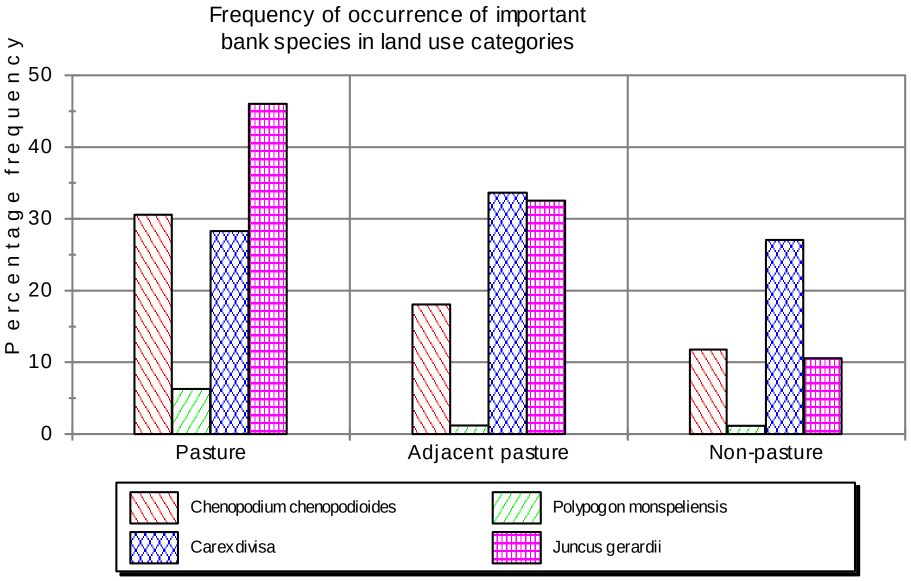
[539] Soil cross-section given in R.D. Green (1968). *Soils of Romney Marsh*, Agricultural research Council, Harpenden, pp. 32-33.

While absences of previously recorded sites are shown on the tetrad map above, fuller data at monad resolution are given in the distribution map below, largely confined to recent records as monad recording only became the norm in the county from 2010.



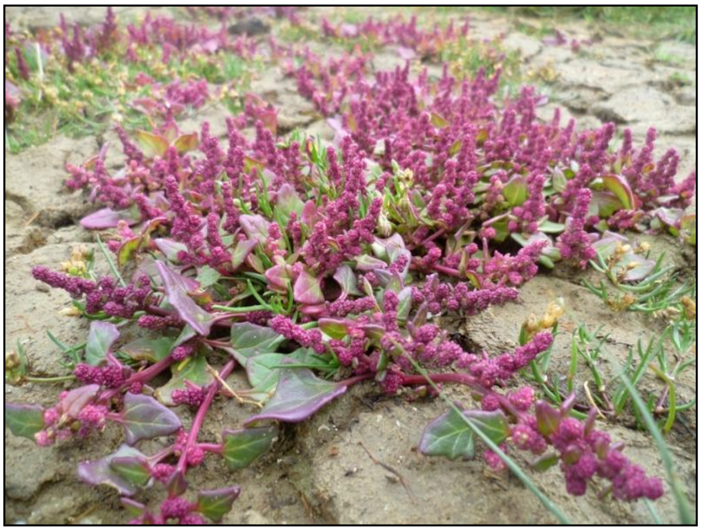
Oxybasis chenopodioides **Kent records to 2024 mapped at monad level, from BSBI database.**

Saltmarsh Goosefoot is annual of brackish mud where exposed in late summer at the edge of coastal dikes or ditches, or in depressions in grazing marshes. Germination appears to require emergence of the mud from winter inundation (the water levels normally falling progressively through summer, drying out some ditches and increasing their salinity), so that the mud with its seed-bank is exposed to light and air. This may not be until July, so that the plant does not always reach full vigour until autumn. In a wet summer its numbers may be considerably reduced. Cattle or sheep stocking helps keep the mud open, trampling down the edges of ditches, and (observed by Rosemary FitzGerald at Swale NNR in 1986) creating through hoof-prints ephemeral habitats in which small plants may appear. The effect of poached ditch margins is borne out by Williams (1995) through an assessment of the frequency of the species in North Kent ditches adjoining different land uses. Saltmarsh Goosefoot was found to be most frequent in ditches adjoining pasture on both sides; less frequent in ditches adjoining pasture on one side; and least frequent in ditches adjoining non-pasture uses (see table below, reproduced with kind permission of Phil Williams and Natural England, in which the plant is given under its former name of *Chenopodium chenopodioides*). Population fluctuations may relate to the extent of disturbance (not just by cattle, but, including the excavation of mud when ditches are cleaned), or to the timing of mud drying out and warming up.



The more brackish ditches in the grazing marshes can be well populated by *Oxybasis chenopodioides*. Williams (1995) found it occurring in over 40% of the ditches in the Neatscourt to Spitend Marshes, in nearly 25% of the ditches in the Swale NNR and Capel Fleet (and along the entire length of Capel Fleet). Associated species are given by FitzGerald (1994)[540]and are mostly annuals reflecting the salinity of Saltmarsh Goosefoot's favoured habitats, including *Oxybasis rubra, Parapholis strigosa, Salicornia* spp. and *Suaeda maritima*; perennials include *Lysimachia maritima, Juncus gerardii* and *Spergularia* spp. At Shornmead fort (which Wolley Dod in 1893 supposed could have been Syme's original 1852 find location) it was found in October 1986 (Rosemary FitzGerald and Alan Leslie) in proximity to *Rumex palustris*, which also favours trampled ditch margins. At Grain, south of the A228 inside the sea wall of Colemouth Creek, it was in the same month recorded as associated with abundant *Polypogon monspeliensis*, which has similar habitat requirements, and was so plentiful that the course of the dried-up shallow fleets could be traced by its characteristic autumn red.

Fairfield. Photo by Owen Leyshon, September 2013



The frequent co-presence of *O. rubra* necessitates distinguishing its dwarf semi-prostrate forms from Saltmarsh Goosefoot. Typical Saltmarsh Goosefoot is more or less prostrate, red (at least on stem and leaf undersides) and with fleshy leaves, rounded-triangular and hardly (if at all) toothed. *O. rubra* is generally more erect, but often also red and with less fleshy leaves more toothed. The tepals of the lateral fruits in each cluster are in *O. chenopodioides* fused fully so as to hide the seed; in *O. rubra* they are fused half-way, so that the seed is visible.

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[540] *Chenopodium chenopodioides*, in Scarce Plants in Britain (1994), (eds.) A. Stewart, D.A. Pearman and C.D. Preston, JNCC, Peterborough.

Oxybasis glauca (L.) S. Fuentes, Uotila & Borsch (*Chenopodium glaucum* L.) (Oak-leaved Goosefoot)

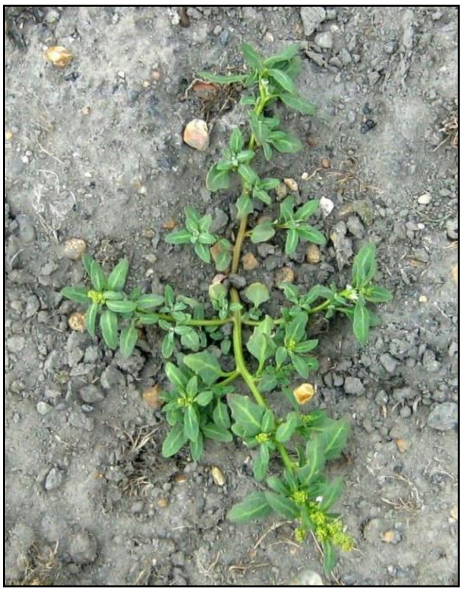
vc 15 and 16

Rarity / scarcity status

Oak-leaved Goosefoot is an archaeophyte, or ancient introduction, with scattered records in England and very few in Scotland, Wales and Ireland. It is **nationally scarce** and there has been a marked decline in the last fifty years as a result of which it is classed as **Vulnerable** both in England and in Great Britain as a whole, although there are data interpretation issues because of the difficulty in distinguishing casual occurrences from permanent populations. It is comparatively well represented in Kent, and so no local rarity or scarcity status is given to it.

Account

The first reference to *Oxybasis glauca* in Kent was by Milne and Gordon in their *Indigenous Botany* (1793), relating to their botanical investigations during 1790-93. The plant was then said to be not uncommon, especially in the neighbourhood of London, being found "plentifully about *Deptford* and *New-Cross*; *in Lee-Lane*; in the lanes leading from *Deptford* to *Brockley*". It was thought to be extinct at these stations by the time of Hanbury & Marshall (1899), presumably as a result of development; but those authors did not know of it otherwise than near London, and considered it to be extremely rare.



Manor Way, Halstow Marshes. Photo by Geoffrey Kitchener, 29 July 2010

It is an annual of manure heaps and nutrient-rich disturbed areas, often impermanent, and also known from damp coastal ground. It appears that the early records are of the former sort, and there was not then any awareness of it as a Kent coastal plant. Subsequent inland records included introduction with wool shoddy, when this was used as manure.

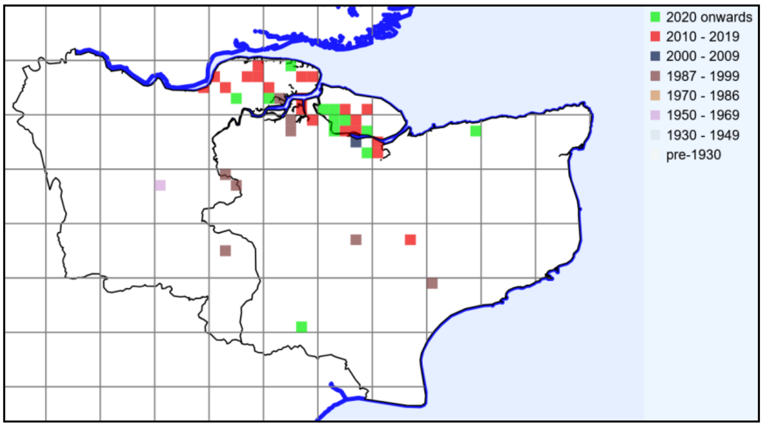
However, by the time of Philp (1982), it was only known in Kent as a plant of coastal waste ground at Yantlet, Conyer (two tetrads) and Lydd (two tetrads). In contrast, Philp (2010) identified 17 tetrad records in the administrative county, around farm buildings, along tracks and on disturbed soils. Some of these were inland and considered to be casuals from former introductions, such as with wool shoddy. Most were by the north Kent coast, and assessed as constituting stable and regular populations on and near the Thames, Medway and Swale. The major increase in records appears to contrast with its national status as a species in decline. However, the increase is not necessarily representative of growing populations, but may rather represent more effective targeting of its coastal habitats.

Luddenham Court. Photos by Lliam Rooney, 26 July 2012

Nevertheless, recording for 2010-24 (32 tetrads, or 49 monads) indicates that even Philp (2010) understates the amount of this species which can be found, especially around the Swale. Some of its North Kent occurrences may not be regular, as requiring timely exposure of mud at the margins of brackish coastal waterbodies, where there have been enormous quantities on occasion, but not every year may be suitable.

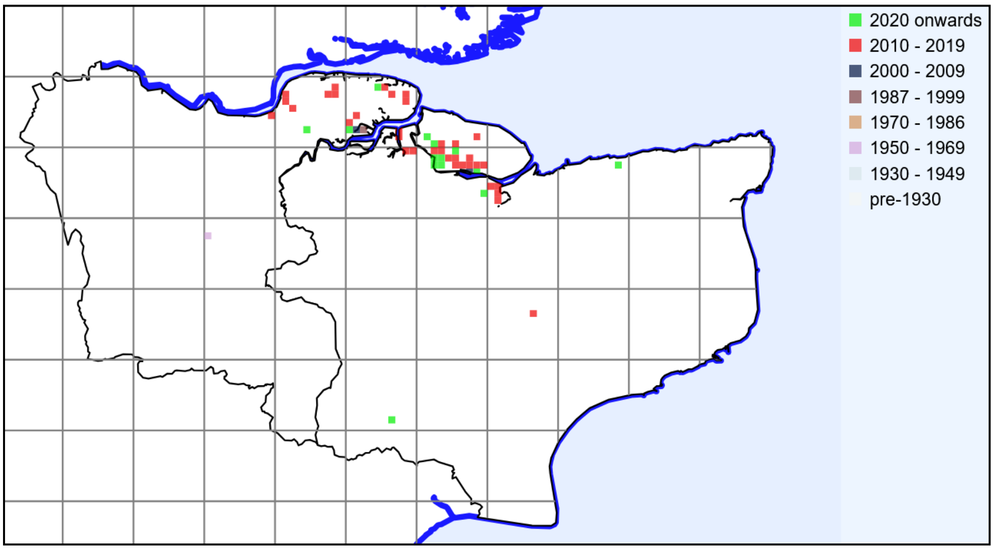
Chattenden, Hoo peninsula, classic manure heap habitat (*Atriplex prostrata* in background). Photo by Geoffrey Kitchener, 17 July 2023

The 2010-24 records reported fall within the north Kent coastal distribution pattern (save for one at Wye, of the traditional inland agricultural type, and another at the Rother Upper Levels, which have a history of marine influence) but point to Sheppey being more populated by the species than was previously assumed. They include presence on cindery or gravelly rabbit-disturbed tracks, subject to some compaction; and in a manured area around a cattle feeding station on the grazing marshes; and on drying mud at the margins of brackish dykes and waterbodies. Some of the more inland sites on Hoo and Sheppey were roadsides and one at Hoo (2023) was of the traditional manure heap character.



Oxybasis glauca **Kent records to 2024 mapped at tetrad level, from BSBI database.**

The mapped north Kent concentrations generally represent plants growing on low ground of reclaimed saltmarsh or marshland; the southern half of Sheppey and one third of the Hoo peninsula comprises land of this nature. Salt-tolerance and an ability to take rapid advantage of temporarily open habitat seem to have given *Oxybasis glauca* an advantage in such circumstances.



Oxybasis glauca **Kent records to 2024 mapped at monad level, from BSBI database.**

Chetney Marshes. Photo by Geoffrey Kitchener, 27 August 2013

Kent Rare Plant Register
Species accounts Part P-Polyga

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date May 2025

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The register formerly included the following species accounts which may now be found at **Appendix A** of the register, https://bsbi.org/kent

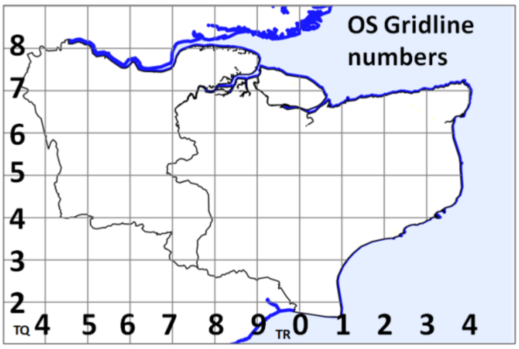
***Poa bulbosa* (Bulbous Meadow-grass)**
***Poa infirma* (Early Meadow-grass)**
***Polycarpon tetraphyllum* (Four-leaved Allseed)**

Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

Recorders' initials:

AL Alex Lockton
AW Tony Witts
BB Benatt, B.
CO Colin Osborne
CW Caroline Ware
DC Danny Chesterman
DM Daphne Mills
EGP Eric Philp
FB Fred Booth
GK Geoffrey Kitchener
GTh G. Thornton
HF H. Fuller
HS Heather Silk
HW Hector Wilks
JP Joyce Pitt
JPtt J. Platts
JRP John Palmer
KBRG Kent Botanical Recording Group
KFC Kent Field Club
LNHS London Natural History Society
LR Lliam Rooney
ME Mike Easterbrook
MPh Mike Phillips
MS Mark Spencer
PH Peter Heathcote
RF Rosemary FitzGerald
RM Richard Moyse
RMB Rodney Burton
SB Sue Buckingham
WFS Wild Flower Society

Other abbreviations and references:

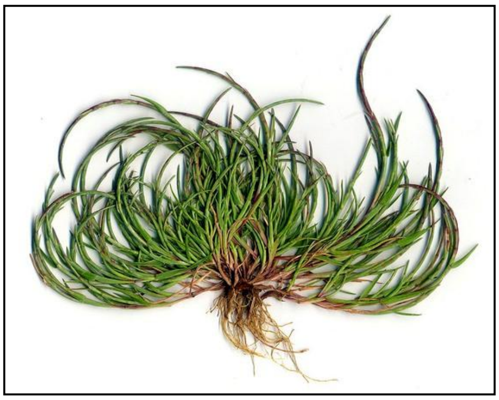
BM =Natural History Museum herbarium	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MOD = Ministry of Defence	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
CGE = Cambridge University herbarium	MNE = Maidstone Museum herbarium	SLBI = South London Botanical Institute herbarium
Hanbury & Marshall (1899) refers to their *Flora of Kent*		

Parapholis incurva (L.) C.E. Hubb. (Curved Hard-grass)

vc15 and 16

Rarity / scarcity status

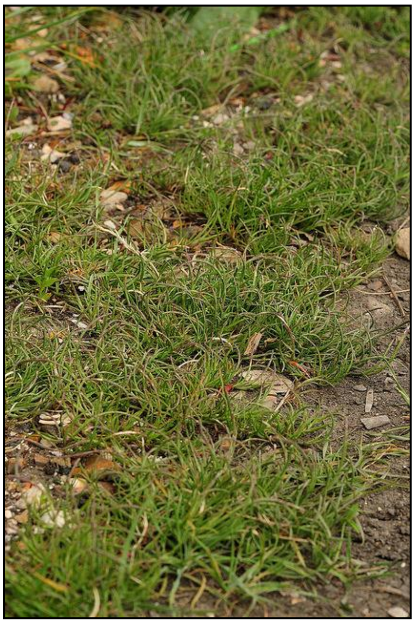
Parapholis incurva is a coastal plant of saline conditions, and also found by inland roads affected by de-icing salt, with its main British distribution along the south and east coasts of England and the south coast of Wales. It is a **nationally scarce** plant whose conservation risk status in both England and Great Britain as a whole is one of 'Least Concern'. It is reasonably well represented in Kent, particularly along the north coast from Seasalter to Thanet, and is neither rare nor scarce in the county. It is a Kent axiophyte and so is indicative of good habitat, other than by inland roads.



From Seasalter. Photo by Lliam Rooney, 22 March 2017

Account

Early records of *Parapholis* (given under *Rotbollia* or *Lepturus*) are not easy to interpret: the separation into which we now call *Parapholis strigosa* (Hard-grass) and *Parapholis incurva* was not well understood. Hanbury & Marshall (1899) identify the first published Kent record of a *Parapholis* species as being by Thomas Johnson in his *Descriptio Itineris* (1632), when in the course of botanising on the shore and steep cliffs near the (then) fort at Margate he recorded 'Gramen parvum marinum spica loliacea'. This, in the edition edited by J.S.L. Gilmour, in which he had the assistance of Francis Rose in identifying current plant names, was taken instead to be *Agropyron pungens* (Pers.) Roem. & Schult., or possibly the hybrid with *A. junceiforme* (*A.* x *acutum* auct,). These taxa have since been called *Elymus athericus* (Sea Couch) and *Elymus junceiformis* (Sand Couch), with their hybrid, *Elymus* x *obtusiusculus*. The assumption that a couch grass was involved has not been followed elsewhere – see below.



Seasalter. Photo by Lliam Rooney, 22 May 2015

Hanbury & Marshall (1899) doubted that Kent records of *Parapholis* generally were anything other than what we now call *Parapholis strigosa*. They hesitated a little over G.E. Smith's description (in his *Catalogue of rare or remarkable phaenogamous plants, collected in South Kent*, 1829) of Hard Grass growing 'Upon the shore, and in dry salt marshes at Dimchurch: upon the shore, Folkestone West', where he saw plants 'with an elongated straight stem and spike' and others 'with a very different habit, and besides its obvious, pale green color…remarkable and deeply striated'. Whilst he was clearly seeing *P. strigosa* and perhaps *P. incurva* as well, Smith felt he did not have enough experience to say if they were separate species. Indeed, in his 1830-33 manuscript notes to his own copy of the *Catalogue*, from observations at Shoreham, Sussex, and Freshwater, Isle of Wight, he took the view that upright growth was a consequence of crowding, and the *incurva* habit ('resembling a small reversed birds' nest') was associated with growing detached from other plants.

Returning to Johnson's Margate find, David Pearman (*The Discovery of the Native Flora of Britain and Ireland*, 2017) took this to be *P. strigosa*, although John Edgington[541] had considered it to be *Parapholis incurva.* Fortunately we have more evidence of what Johnson found, as he wrote it up in his 1633 edition of Gerard's *Herball*. He says 'The last yeare at Margate [this would be 1632] in the Isle of Tenet, neere to the seaside and by the chalky cliffe I observed a pretty little grasse which from a small white fibrous roote sent up a number of stalkes of an unequall height; for the longest, which were those that lay partly spred upon the ground, were some handful high, the others that grew straight up were not so much; and of this, one inch and a half was taken up by the spike or eare, which was not thicker than the rest of the stalke, and seemed nothing else but a plaine smooth stalke, unless you looked upon it earnestly, and then you might perceive it to be like Darnell grasse wherefore in the journall that I wrote of this Simpling voyage [the *Descriptio Itineris*], I called it *pag .3. Gramen parvum marinum spica Loliacea*'.

There can be no doubt from this description that he saw *Parapholis* (in which the flowers appear as though hidden in the culm) and that Gilmour and Rose were wrong in supposing that it was a couch grass. As to whether it was *P. strigosa* or *P. incurva*, Johnson refers to the longest stalks as partly spread on the ground (which they do in *P. incurva* before spreading upwards and incurving) and other shorter stalks as growing straight up (which sounds like *P. strigosa*, but the central stalks of *P. incurva* can do this as well, especially when young).

For further evidence of identity we need to consider also habitat, Johnson's find being near to the shore and by the chalky cliff. There is no suggestion of salt marsh (the upper parts of which would be suitable for *P. strigosa*), nor does the present coastline here (the former fort promontory near the harbour) render it likely. The presence of cliffs points more to *P. incurva*, which prefers drier ground, often within reach of sea spray. In habitat terms, *P. incurva* appears more likely and, indeed, was recorded for the tetrad including Johnson's site, in Philp (1982). More recently (2019) it has been recorded for what, making allowances for reclamation and sea defence works since the 17th century, must be virtually the exact spot of Johnson's find, insofar as it can be reconstituted – remarkable persistence on the part of an annual.

Margate, Johnson's 1632 location. Photo by Sarah Kitchener, 16 July 2019

Parapholis strigosa has also been recorded further west and although both species are present along the continuation of the north Kent coast westwards, *P. strigosa* was probably the more common species in Johnson's day beyond Seasalter, when one would have left behind the chalk cliffs and, without the benefit of sea defences, have come to the flat lands with the residual Wantsum channel cutting off the Isle of Thanet. But as regards Johnson's site at the chalk coastline by Margate harbour, *Parapholis incurva* is the more likely species to have encountered, then and now. If this accepted, the Kent record is also the first British record.

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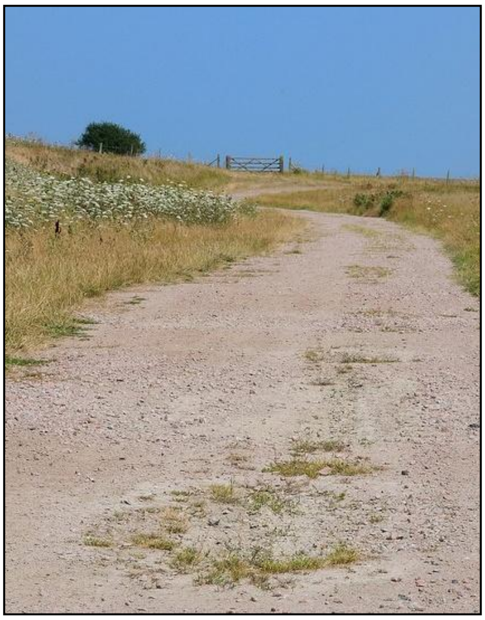
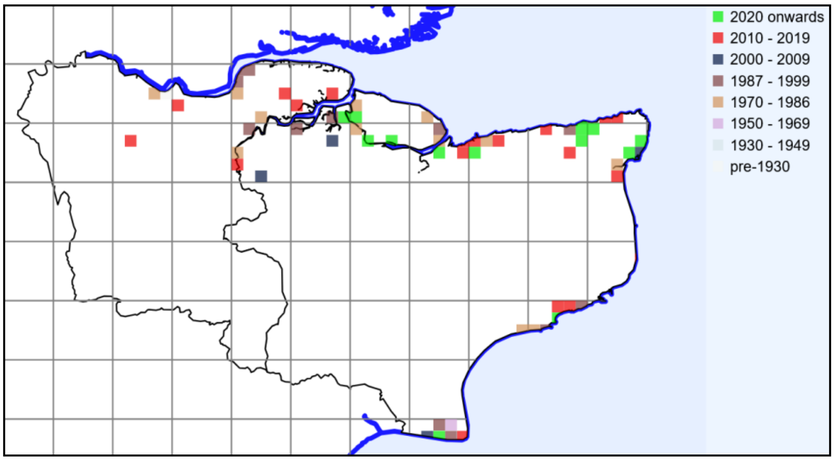
[541] Edgington, J.A. (2010). First British record of *Nardus stricta*. *Watsonia* 28: 123-127. David Pearman (personal communication) has since acknowledged that there a case for Johnson's find indeed being *Parapholis incurva*.



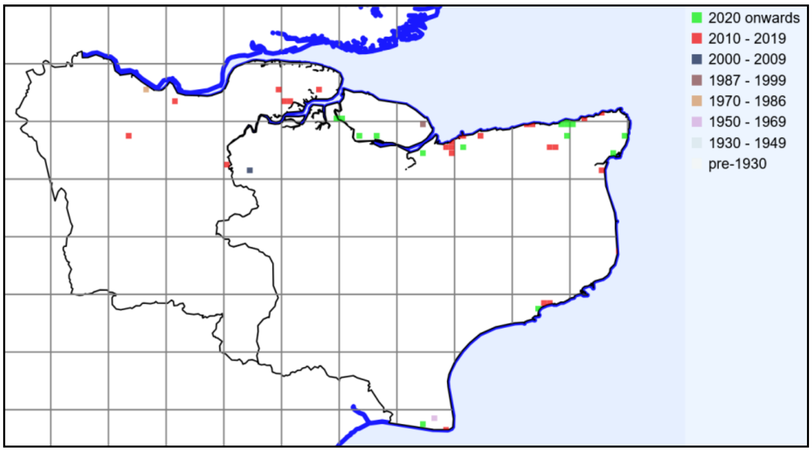
North of Graveney Marshes, habitat. Photo by Lliam Rooney, 3 August 2011

Francis Rose knew of *Parapholis incurva* on the north Kent coast at Grain north and south beaches (1945, 1955); near Upnor (1951 and 1960) Shellness (Sheppey, 1956); west of Minnis Bay (1961); and Westgate (1946); also at Oare Creek and at Cuxton near the tidal Medway. On the east coast, it was found at Shellness (Sandwich, 1952) and by J.P.M. Brenan in 1937 at the foot of the chalk cliffs between Folkestone and Dover. There were a couple more finds in a habitat much like the last – on a shingly bank behind the cliff base sea-wall at Lydden Spout (1953-55) and similarly below Abbot's Cliff (1960). Some of these locations were still extant for Philp (1982), in which 24 tetrads were recorded with a distribution from the tidal Medway, around Sheppey, along the north coast, around Thanet, between Dover and Folkestone, and an outlier at Dungeness. Its habitat was given as on bare ground along sea-walls and on cliffs in coastal areas, often growing in a narrow band along an area that will be reached by the salt spray during rough weather. The position was very broadly similar in Philp (2010), although with 21 tetrads, including additional records in the Cliffe and Dungeness areas, but less on Sheppey, the north coast through to Thanet and the Dover/Folkestone area.



***Parapholis incurva* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The 2010-24 records cover 33 tetrads (40 monads), noticeably exceeding the 1991-2005 total, and with a somewhat different distribution, concentrated on the coastline from Faversham to Margate rather than the lower Medway and Cliffe. The likelihood is that the difference is a product of the manner of survey, given that habitats are unlikely to have changed enough.

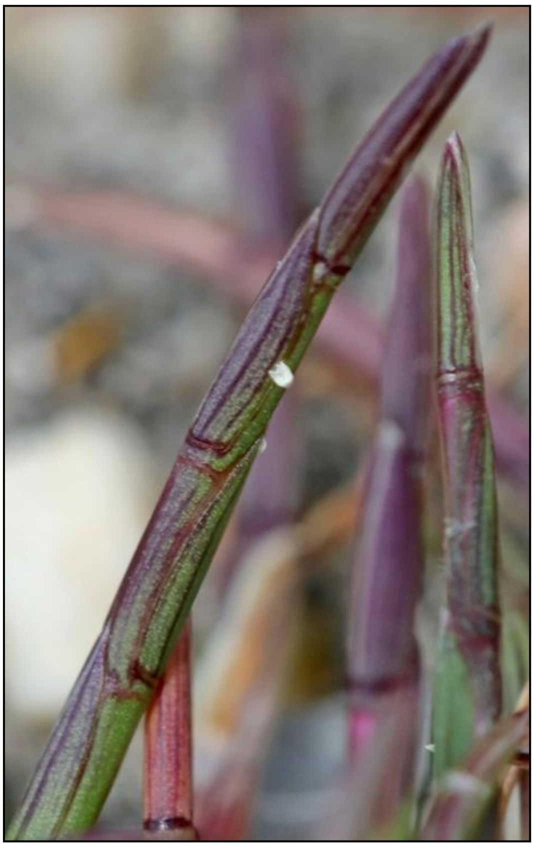


***Parapholis incurva* Kent records to 2024 mapped at monad level, from BSBI database.**

Mapping is given here separately at tetrad and monad resolution, as the former displays hiistoric records more fully, given that tetrad recording was the norm in Kent for 1970-2009 and monad recording from 2010 onwards.

There is, however, an interesting development mainly in West Kent, where the grass is now increasingly encountered away from the coastal spray zone and on inland roads affected by de-icing salt. There are roadside records by the A20 near Farningham; by the A226 south of Northfleet; on the A228 verge near Holborough (and again near High Halstow); by the B2001, Grain Road; and in East Kent, by the A2990, Whitstable. Older roadside records not included here are in the centre reservation of the A21 Tonbridge bypass from 1984 to 1994, when it was lost by roadworks substituting a surfaced centre with crash barriers; and by the A229 at Blue Bell Hill (East Kent) in 2009. While a number of salt-tolerant grass species have made the transition from coastal saltmarshes to their artificial inland linear equivalent, *Parapholis incurva* does not seem to have done so in Kent as successfully as some others, such as *Parapholis strigosa* (Hard-grass), *Puccinellia* spp. (Saltmarsh-grasses) and *Catapodium marinum* (Sea Fern-grass). The reason for this is not evident, except that the rarer the grass in its coastal habitats, presumably the fewer are the opportunities to spread, if hitching a lift on vehicle tyres is the means of doing so. It has been noted in some coastal localities on shingle stabilised with sandy soil, to which vehicles have access.

It is an annual, subject to population fluctuations from year to year. Accompanying species noted in Kent include *Catapodium marinum*, *Parapholis strigosa* and *Spergularia marina* (Lesser Sea-spurrey). Because of the unusual flower structure, the only other species (except for rare aliens) with which it might be confused is *Parapholis strigosa.* However, *Parapholis incurva* is generally shorter (rarely over 10cm high) with strongly curved culms and with shorter anthers. Anther length is 0.5-0.81(1.1)mm in *P. incurva*; (1.5)2.2-3.1(3.5)mm in *P. strigosa.* Anther length is recommended for determination, as inland plants may well adopt a slender, perfectly upright habit similar to that of *P. strigosa*[542]*;* the author has replicated this growth habit by transplanting Kent material into garden soil. However, it is not so apparent that *P. strigosa* may be affected by growth conditions so as to mimic the short, incurved habit of *P. incurva*; so anther length is more relevant to confirmation of the identity of *P. strigosa*. There may have been some under-recording of *P. incurva* due to reluctance to record outside the flowering season (early June to mid-July), when anthers are present.



Folkestone Warren, flower spike with anthers exserted.
Photo by David Steere, 9 June 2018

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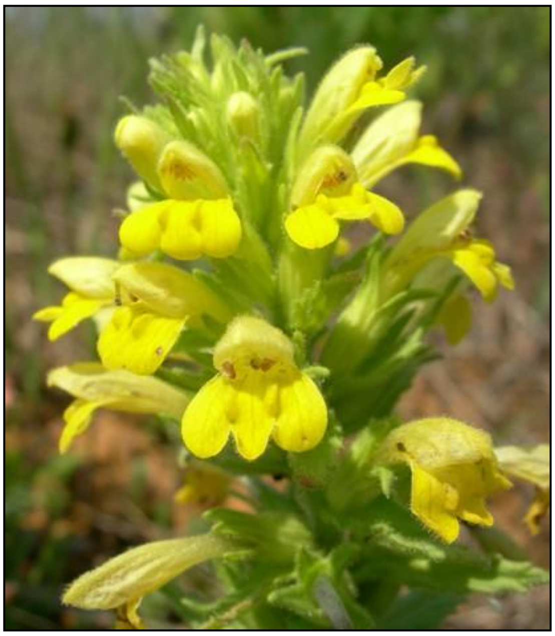
[542] Cope, T. & Gray, A. (2009). *Grasses of the British Isles*. Botanical Society of the British Isles, London.

Parentucellia viscosa (L.) Caruel (Yellow Bartsia)

vc15 and 16

Rarity / scarcity status

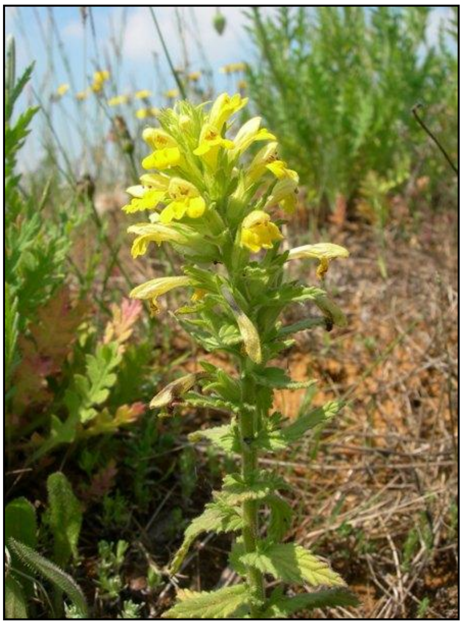
Yellow Bartsia as a native plant is widespread in the British Isles, found especially in damp, sandy, open grassland in south west England and Dorset/Hampshire. Its northerly occurrences are often attributable to introduction with grass seed and it is in general sufficiently frequent that its conservation risk assessment is of 'Least Concern', both in England and Great Britain as a whole. It is, however, **scarce** in Kent, especially in West Kent.



Ashford. Photo by Daphne Mills, 3 June 2007

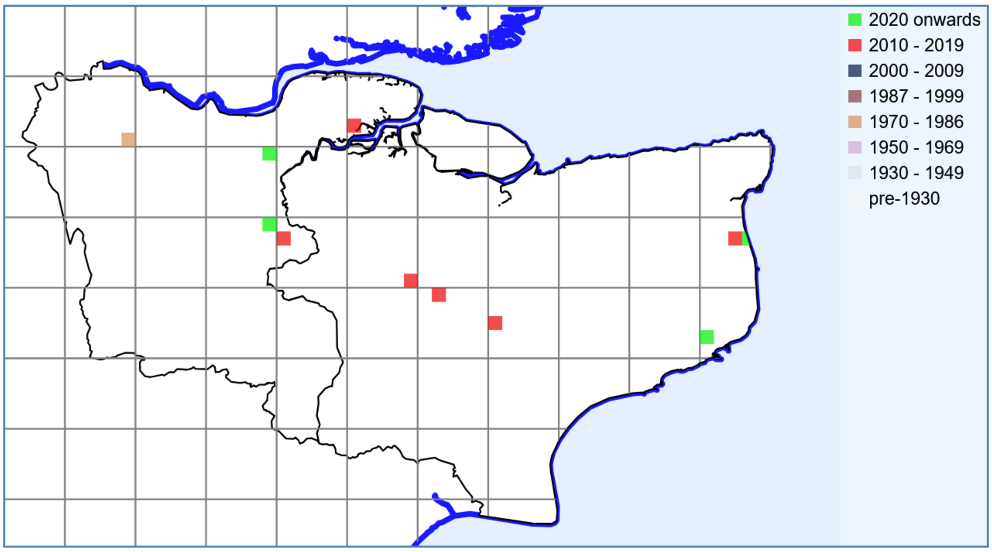
Account

Parentucellia viscosa was not recognised as a Kent plant by Hanbury & Marshall (1899), and its first occurrences in West and East Kent are surprisingly late, for such an obvious plant. That for West Kent was a note by Frederick Hanbury in the *Journal of Botany* (1927) **65**: 319: 'A few days ago the Honourable Mr. Justice G.J. Talbot sent me a specimen of the above gathered in a rough pasture near Cowden. This I believe to be the first record of the occurrence of this species in Kent. There were many other specimens of the plant in the same field. The finder would prefer not to give any more detailed information as to its exact locality'. Presumably, the plants were on Talbot's Falconhurst estate in the Cowden Pound/Markbeech area and he was unwilling to encourage botanical trespassers. It would have been on either Wadhurst Clay or (more likely) the Ashdown Formation – it has been found in Sussex on the latter. The first East Kent find was by Francis Rose at Sandwich Bay in 1960, where the fixed-dune grassland in dryish dune-slacks is a well-known habitat in other parts of the British Isles; it has persisted in the Sandwich area since.



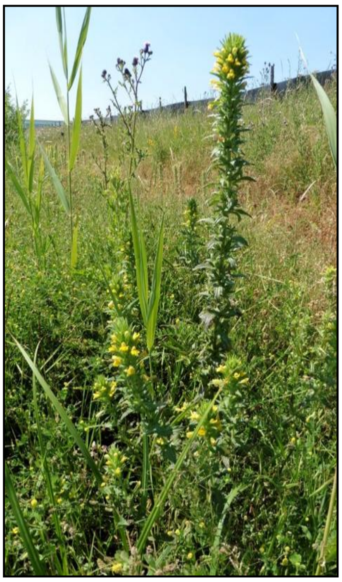
Ashford. Photo by Daphne Mills, 3 June 2007

There have been relatively few records subsequently, mostly at Sandwich Bay, but also at inland sandy locations especially on the Folkestone Formation. There is a record near Westerham (1952) which may have the same geology but is without detail and so cannot be put into context. Philp (1982) gave it only at Joyden's Wood (presumably on sand/gravel) and Sandwich Bay; Philp (2010) gave it at Sandwich Bay, near Ashford, Lenham, and probably introduced at Ditton Quarry. There has been continuity for these last locations despite *Parentucellia viscosa* seeming a potentially ephemeral plant because it is an annual, reliant on open ground or disturbance for re-establishment each year, and so at risk from the sward closing up with rank vegetation. This risk is probably less on sandy soils, because of stress on competitive plants generated by the soils' lesser nutrient content and free-draining nature. Recent records have also included a new site (2014) on the Folkestone Formation at Hurst Wood, Charing, which appears to be associated with the construction of the High Speed 1 rail link. It is possible that the means of introduction was grass seed sowing; the seed of *Parentucellia viscosa* is extremely small and may well escape any seed cleansing process. Introduction of some sort must also account for a casual record at Bluewater shopping centre in 2008; this is in a chalk pit which normally would seem inappropriate for the species. A site found in 2018 related to a brackish lake and embankment created on the Hoo peninsula (the lake between 2011 and 2013; the bank a little later) for commercial development: recent habitat with open ground, but especially favourable for *Parentucellia viscosa* in the lake draw-down zone, where enormous branched plants were growing up to 90cm high (the norm is up to 50cm). Records for 2010-24 encompass ten tetrads (11 monads).



***Parentucellia viscosa* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Ashford, habitat. Photo by Daphne Mills, 3 June 2007



Hoo peninsula, habitat damp ground by brackish lake. Photo by Geoffrey Kitchener, 25 June 2018

Yellow Bartsia is hemiparasitic and may germinate without host; it parasitises other plants, but can also derive energy from photosynthesis and so is not as dependent upon parasitism as some other members of the family Orobanchaceae such as broomrapes. It is compatible with a wide range of host plants, in particular grasses and legumes: Japanese studies[543] note haustorial connections with *Lolium perenne* (Perennial Rye-grass), *Picris hieracioides* (Hawkweed Oxtongue), *Rumex acetosa* (Common Sorrel) *Trifolium dubium* (Lesser Trefoil),

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[543] Suetsugu, K., Takeuchi, Y., Futai, K. & Kato, M. (2012). Host selectivity, haustorial anatomy and impact of the invasive parasite *Parentucellia viscosa* on floodplain vegetative communities in Japan. *Botanical Journal of the Linnean Society* **170**: 69-78.

Trifolium pratense (Red Clover) and *Trifolium repens* (White Clover), but host selectivity may vary across the geographic range of *Parentucellia viscosa.* None of our recent records includes any observations on possible host plants (species growing within 15cm).

Site	Grid reference	Site status	Last record date	Recorder	Comments
Eltham, Pippenhall Meadows (metropolitan vc16)	TQ4374		(1) 8 July 2006 (2) 2002 (3) 29 July 1990	(1) MS (LNHS meeting) (2) MS & JR (3) RMB	(1) Still abundant and in one field dominant, but overgrazed (by horses). (2) Several thousand plants. (3) TQ 438 743, c.30 dry fruiting plants at north margin of south field.
Joyden's Wood	TQ47V	Access land	(1) 31 August 1981 (2) After 1970, before 1981	(1) JRP (2) Philp (1982)	(1) Open dampish grassy place not far from shaded ponds c. TQ 499 713. (2) Heathy area in Joyden's Wood.
Bluewater	TQ5773		12 July 2008	FB & DM	TQ 579 739, survey included fenced-off area with several plants by path leading up steep bank on north side of shopping centre site; thought to have become overgrown since.
Leybourne	TQ6858		20 June 2023	SL	(a) Leybourne, north of Leybourne Wood, TQ 6848 5871. Scrubby top of A228 just over fence in small area of grassland. 1 large flowering plant (b) TQ 6846 5868. Grassland reverting to scrub on west side of A228. Small cluster of around a dozen flowering shoots. Origin of this and last as possibly introduced during 2007 when ground cleared/disturbed during creation of A228.
Shorne - Cobham	TQ6869		01 July 2021	DS	Two flowering plants found at TQ 6820 6955 in amongst the usual chalk flora, definitely not sown or planted. A further 180+ plants found in flower on railway land at TQ 6826 6959 which may have been amenity planting or a contaminant in such planting.
Ditton quarry	TQ75D	Local nature reserve managed by Ditton Parish Council	(1) 4 July 2012 (2) 16 June 2004 (3) 1991-2000	(1) & (2) ME (3) EGP in Philp (2010)	(1) re-found (ME first found here what was the origin of Eric Philp providing a tetrad record in the 2nd Kent Atlas), 1 spike in quarry at TQ 715 575. (2) TQ 715 575. (3) Landscaped former ragstone quarry, almost certainly introduced.
North Street, Hoo	TQ8173		(1) 25 June 2018 (2) 22 June 2018	(1) & (2) GK	(1) From TQ 81529 73459 to TQ 81647 73473, plentiful along northern side of brackish lake, in upper draw-down zone, most on still damp ground, some dried out higher up. Well grown plants, up to 90cm high and branched. This lake appears to have been created between 2011 and 2013. (2) TQ 8144 7344, many plants (25 June 2018 - over 125) along c.15m of semi-bare (unsown) embankment, not long since created, on top and south-facing side. Area has been cleared and is

					marketed as development site.
Lenham, south east of Sandway	TQ8950		(1) 2 July 2019 (2) 26 July 2011 (3) 13 July 2008 (4) After 1990, before 2006	(1) DC (2) SB (3) RM (4) Philp (2010)	(1) TQ 89537 50661. (2) Two plants on sandy bank above a pond, TQ 89538 50668 and TQ 89529 50676. (3) Chilston pines, TQ 897 507. (4) Given as TQ85V, sandy heathland, and assumed to be this monad.
Hurst Wood, Charing	TQ9348		(1) 7 June 2015 (2) 29 August 2014 (3) 4 July 2007	(1) KFC meeting, comm. JP (2) AG, JP & MPh (3) DM	(1) Colony in damp young alder scrub on slope, where seen in 2014, TQ 9307 4841. (2) TQ9307 4841, 24 plants in small glade of Hurst Wood, grassy / scrubby bank close to HS1 railway line, on Folkestone Sands. (3) Newlands Road pit, TQ 9370 4859 (also noted by JP as present, 2009).
Eureka Park, Ashford	TR04C		(1) 7 June 2018 (2) 24 June 2015 (3) 8 June 2007 (4) 3 June 2007 (5) 7 August 2005	(1) SB (2) FB & DM (3) EGP (4) DM (5) HS	[not seen, 2022, HS, site is scrubbing over.] (1) 100+ flowering plants on sand at TRv0059 4514, close to a car park just off Lower Pemberton. This colony just a hundred yards or so from 2013 record. (2) Eureka Park, 36+ plants at TR 00806 45084, and 30+ plants at TR 00735 45074. As regards this last grid reference, there is a small ditch that runs in between the main site and the A259 footway. The plants were on the edge of the ditch on the main site side. This (broadly) is the site found by HS in 2005. (2) Given as TR04C, assumed to be TR0045. (3) TR 0073 4504. (4) At least 700 plants in light grassland on sand, part of an area scheduled for business development. The main grouping was generally within an area of 35x35m centred on TR 0082.4507. This colony is unlikely to survive redevelopment, although some plants may continue on the road verge. *Filago germanica* and *Logfia minima* were also present.
Dover, Buckland	TR3043	KWT reserve	28 May 2024	DS	TR 302 435 Single plant found in open chalk grassland.
Sandwich Bay	TR35N, includes TR3557	SSSI	(1) 1 August 2011 (2) 1991-1998 (3) After 1970, before 1981	(1) SB (2) EGP (3) Philp (1982)	(1) (a) One plant in dune grassland at TR 35858 57517. (b) Another in sandy dune grassland at TR 35867 57522. (2) TR35N (3) TR35N, damp grazing meadow.
Sandwich Bay	TR35T, includes TR3656, TR3657,		(1) 11 August 2024 (2) 19 June 2020 (3) 1 August 2011	(1), (2) & (3) SB	(1) still prolific by bird scrape at TR 362 569. (2) Enlarged bird scrape. (2) (a) Estimated 100 plants on banks of bird scrape TR 36141 56993, area managed by Sandwich Bay Bird Observatory. (b) Estimated 50 plants on banks of bird scrape TR 36099 57062.

Pedicularis sylvatica L. (Lousewort)

vc15 and 16

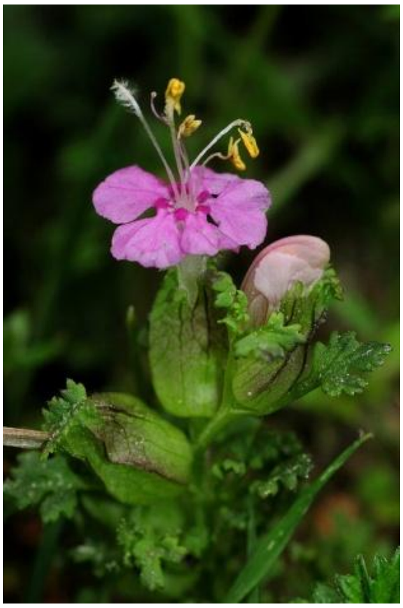
Rarity / scarcity status

Lousewort is widespread in the British Isles, on damp heaths and moorlands, but is largely absent in Eastern England and is in decline in the south as well as regards its residual eastern presence. Although its threat status for conservation purposes is treated as of 'Little Concern' in Great Britain as a whole, in England it is classified as **Vulnerable** to the risk of extinction. This is on account of its area of occupancy in England being taken to have declined by 39%, and its extent of occurrence by 30%, in comparing records for the periods 1930-69 and 1987-99. In Kent, the number of tetrad records for the species has declined by 58% between 1971-80 and 1991-2005. So, while the species is still neither rare nor scarce in the county, its rate of decline on that basis is concerning. It is a Kent axiophyte and so is indicative of good habitat.

Hothfield. Photo by Lliam Rooney, 19 April 2011

Account

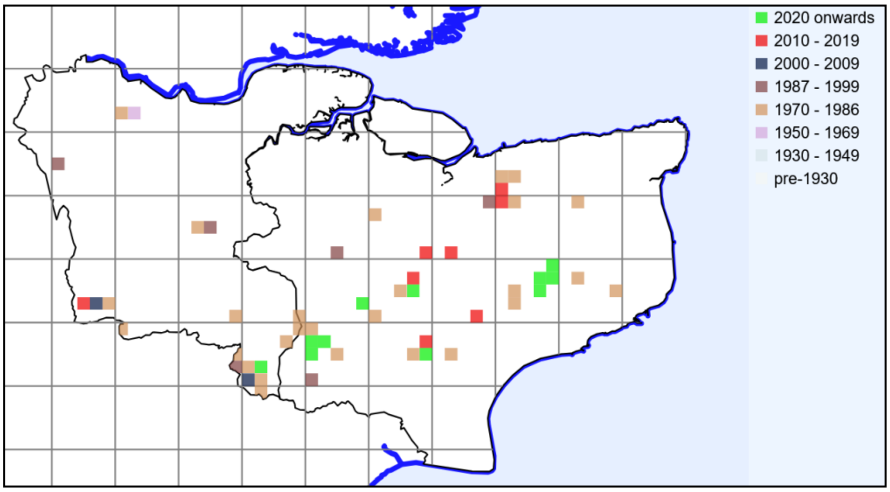
The first published Kent record, according to Hanbury & Marshall (1899) was by Thomas Johnson in his *Iter Plantarum* (1629). It was listed amongst a number of wetland plants encountered in marshes between Dartford Salt Marsh and Erith. Francis Rose (in the 1972 edition of Johnson's book) considered that Johnson did not distinguish between *Pedicularis sylvatica* (Lousewort) and *Pedicularis palustris* (Marsh Lousewort), and that the likely habitat here favoured the latter species instead. Both species can, however, be found in similar habitats; but *P. palustris* (now extinct in Kent) is more tolerant of a base-rich substrate, and the River Darent, which crossed Johnson's route, is influenced by the chalk in its passage through the North Downs. So it is an open question as to whether this is the first record. Otherwise, the first is probably by Edward Jacob who in his *Plantae Favershamienses* (1777) gave both species. *P. palustris* on the coastal marshes round the Oare powder mills, and *P. sylvatica* as common in Jud's Wood (which is acid ground on Thanet Sands).



Hothfield, with peloric flower. Photo by Lliam Rooney, 17 May 2011

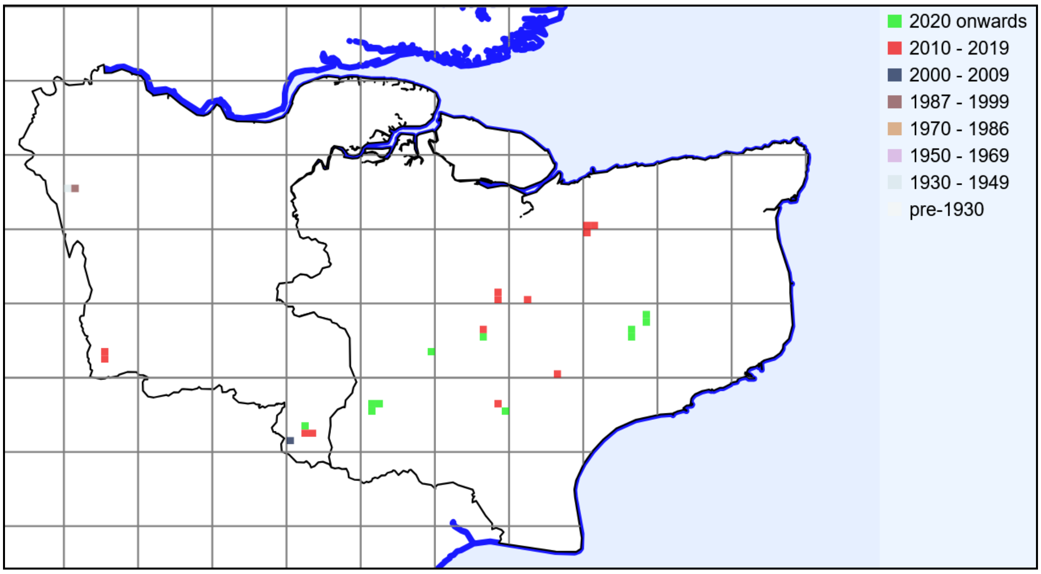
Hanbury & Marshall (1899) considered Lousewort (they called it Dwarf Red-rattle) to be not very common in the county, a plant of heaths, open copses and damp hill-pastures. Many of the records cited by them across the county are clearly on acid ground, such as Keston Common, Chartham Hatch, West Blean Wood, Tunbridge Wells Common, Fawke Common, Hothfield Heath. Where geological conditions are not obviously acid, it will be a consequence of superficial deposits, such as gravels on top of the downs above Charing, where Lousewort was found by Marshall. A similar picture was given by Francis Rose, considering the position 1940-60: he noted it as a native of dry and wet acid heaths, pastures and heathy woodland rides on acid ill-drained sandy or loamy soils; locally frequent in the High Weald, in several places on the Greensand (Folkestone Sand and chert-covered plateau of the Hythe Beds) and on the Pliocene loams, sands and gravels of the chalk plateau, also on the Tertiary sands and gravels of north Kent; widespread, but not a common plant. This breadth of occurrence still supported records in Philp (1982), providing a total of 43 tetrads, of which a fair quantity lay in the Weald. It was then said to be a plant of damp heaths, bogs, marshes and damp woodland. Philp (2010) commented that Lousewort appeared to have become less common in recent years, a conservative statement in view of the substantial drop to 18 tetrads. No reason was assigned, but habitat loss may well have been a function of drainage schemes, 'improvement' of acid grassland and heathland losses generally.

The 2010-24 records cover 19 tetrads (24 monads); and so more or less holding steady at 1991-2005 levels, without the previous decline having continued. The distribution shown is essentially similar.



***Pedicularis sylvatica* Kent records to 2024 mapped at tetrad level, from BSBI database.**

If losses have now stabilised, it may be that the earlier decline is related to loss of heathland or unimproved acid grassland, and that heathland restoration projects, especially in the current century (see account for *Calluna vulgaris*) have stopped or reversed the trend. It now appears to be absent from the north west, and very scarce in West Kent in any event. In the north west it has been known at Crofton Woods near the site of the old fever hospital (TQ4466, in 1974); at Dartford Heath (probably TQ 518 729, in 1987); and at Hayes Common (TQ410 651, in 1987, but perhaps affected by road widening since). Equally, however, records in the western High Weald seem to have dried up.



***Pedicularis sylvatica* Kent records to 2024 mapped at monad level, from BSBI database.**

Mapping is given here separately at tetrad and monad resolution, as the former displays historic records more fully, given that tetrad recording was the norm in Kent 1970-2009 and monad recording from 2010 onwards.

Pedicularis sylvatica is a biennal or perennial hemiparasite, capable of taking up nutrients via the roots of other plants, but able to photosynthesise and so not wholly reliant upon their presence. It grows in damp ground and has a high rate of transpiration, both day and night, the function of the leaf stomata being to maximize water loss (rather than the usual minimisation) and facilitate the uptake of water and soluble nutrients from host plants[544]. As regards host plants, experiments in Belgium[545] have shown that *Pedicularis sylvatica* has a significant effect on the performance of *Erica tetralix* (Cross-leaved Heath), Juncaceae spp. (rushes, etc.) and to a lesser degree *Calluna vulgaris* (Heather). Incidentally, the two heath species are known to have mycorrhizal associations, and this may complicate the impact of *Pedicularis sylvatica* if it shares mycorrhizae as an alternative means of nutrient uptake.

Our 2010-24 records include reference to associated plants being *Calluna vulgaris* and other heath species and, on a damp ride at Bedgebury, *Lysimachia minima* (Chaffweed) and *Linum radiola* (Allseed). Woodland rides or paths are the habitat most frequently noted; in more open terrain, it has been seen in grassy fields and at the margin of bogs or mires.

There are two British subspecies, but subsp. *hibernica* has a western distribution and the Kent plant is subsp. *sylvatica*. The only other native *Pedicularis* species is *P. palustris,* a larger plant, often bushy and bronzed, with darker flowers bearing two lateral pairs of teeth (one pair in *P. sylvatica*), and capsules longer than the calyx (shorter or equal in *P. sylvatica*): but it has not been seen in Kent since 1954.

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[544] Press, M.C., Graves, J.D. & Stewart, G.R. (1988). Transpiration and carbon acquisition in root hemiparasitic angiosperms. *Journal of Experimental Botany* **39**: 1009-1014.

[545] Demey, A. et al. (2015). The effects of hemiparasitic plant removal on community structure and seedling establishment in semi-natural grasslands*.* *Journal of Vegetation Science* **26**: 409-420

Persicaria minor (Huds.) Opiz (Small Water-pepper)

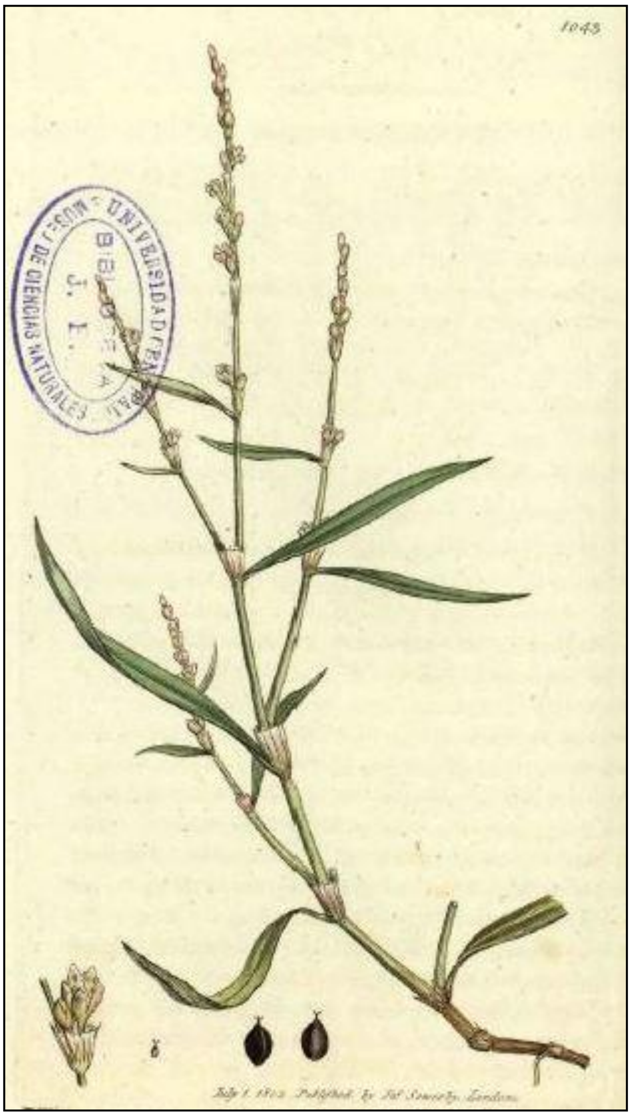
vc15 and 16, but in neither recently

Rarity / scarcity status

Persicaria minor has a scattered distribution across the British Isles in wet places subject to seasonal water fluctuation, but is not common. It has been considered as **Vulnerable** to the risk of extinction in Great Britain as a whole, but a more recent assessment for England treats the threat level as being one of 'Least Concern'. In Kent, it is very **rare** and, indeed, has not been seen this century.

Account

The first Kent record for Small Water-pepper was at Blackheath. Hanbury & Marshall (1899) refer to a manuscript note on a drawing of this species as from the 'Side of Kent road, Blackheath, 1802'. The drawing was engraved by James Sowerby for James Smith's *English Botany* (1802, vol. 15), the text of which says 'In Tothill-fields, Westminster, as well as about Blackheath, we find it in the greatest abundance'. Daniel Cooper mentions it in *Flora Metropolitana* (1836), but this is only a repetition of the *English Botany* record.



Blackheath, from *English Botany*, 1802.

Thomas Forster gave it as 'In moist and stony places' in his *Flora Tonbrigensis* (1816), but Hanbury and Marshall considered that this most likely referred to stations in Sussex. They had, however, received a record from Seal Chart (1874) from F.C.S. Roper; but did not include in the *Flora of Kent* a record by John Stuart Mill (1863) from Willesborough Lees.

Later records are also scanty. There is a specimen from Haysden, Tonbridge, by the Medway, found by G.E. Shaw in 1938. Francis Rose assessed the species as extremely rare on wet open ground, especially on gravel soils, by ditches and ponds. He found it at Chislehurst Common (still there in 1965) and at a freshwater pool in shingle, Halfway Bush, Dungeness, both records in the 1940s and apparently detected amongst his specimens deposited at Maidstone Museum.[546] Philp (1982) gave a perhaps surprising number of records in view of the paucity before and since: ditches and wet fields in five tetrads, viz. Sundridge TQ45W (but printed incorrectly as TQ44W); Hildenborough TQ54U; Aylesford TQ75E, Sandhurst TQ82C; and Conyer TQ96M. By the time of the Philp (2010) survey of 1991-2005, all that could be found were a few plants alongside a ditch near Sandhurst, TQ82D. It has not been found since. It has, however, been found by Ben Benatt (confirmed by John Akeroyd) in July 2021 near Bewl Water, only 250m on the West Sussex side of the vice county boundary, which is the River Bewl.

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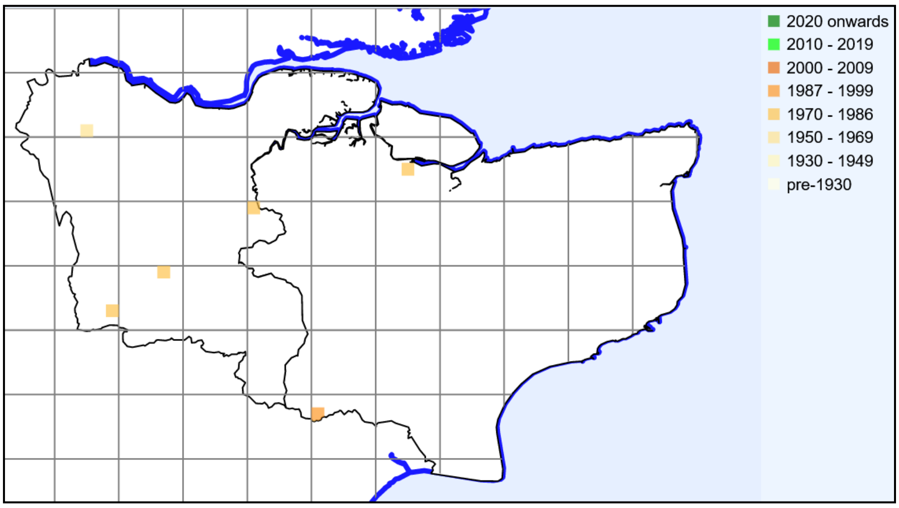
[546] Rose, F. (1960) Botanical Records for Kent, 1955-58 – Vascular plants. *Kent Field Club Transactions* **1(3):** 56-65. This report gives the date of both finds as 1945, but it appears as though 1946 was intended.

The Sandhurst site was selected for resurvey in 2012 as part of the BSBI's Threatened Plants Project, but water was too high in the relevant dyke for there to be hope of re-finding. Indeed, that summer was the wettest for a century and none of eastern England sites resurveyed yielded any plants. This pointed to the dependency of the species on seasonally variable water levels, and the potential for its return under appropriate conditions, given its long-lived seed-bank.[547]

The general paucity of Kent records is a reflection of its rarity; but it is also a species not easily detected since *Persicaria hydropipe*r (Water-pepper) is common and grows in similar habitats. It should be sought, according to Owen Mountford[548], in open communities developing on nutrient-rich mud as the water level of ponds and ditches falls in the latter part of summer, with plants such as *Bidens* spp. (Bur-marigolds), *Chenopodium* spp. (Goosefoots) and *Rumex* spp. (Docks). This low-competition community favours late-germinating plants with rapid growth, and the annual *Persicaria minor* shares these characteristics.

Persicaria minor Kent records to 2024 mapped at tetrad level, from BSBI database.



It is a small, elegant plant, a little sprawling, and bearing narrow leaves and slender, erect flower spikes, the flowers being reddish-pink (pale pink to greenish-white with *P. hydropiper*). The erect, rather than nodding spike, may be the first clue as to whether a plant found is not *P. hydropiper*, and It may readily be told apart from the latter by the absence of a peppery taste to the leaves, but this is a test where the first taste *of P. hydropiper* somewhat obscures any subsequent testing! Further points of separation of the two species involve examination of the perianth (many raised glands on the surface of *P. hydropiper*; none on the surface of *P. minor*); or of the nut (dull in *P. hydropiper*; somewhat shiny in *P. minor*).

There is also another species similar to *P. minor*, and that is *Persicaria miti*s (= *P. dubia*, Tasteless Water-pepper), at one time considered probably extinct in Kent, but re-found in 2020. While it is similarly an elegant plant with pink flowers, the spike is somewhat nodding, the shiny nut is longer than 2.5 mm (mean 3.0mm), the perianths are mostly divided into four (rather than five) segments and bear a few flat glands, and its leaves are proportionately shorter/wider than those of *Persicaria minor*.

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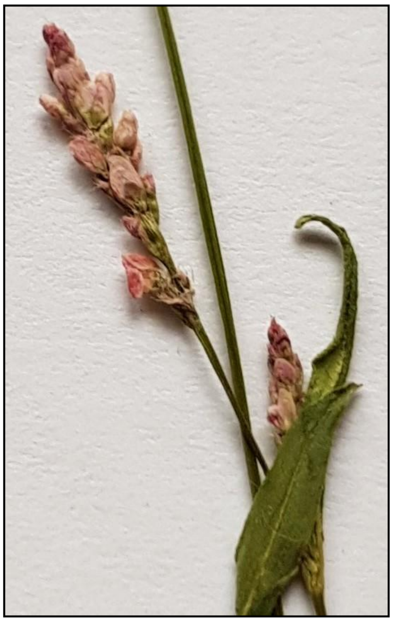
[547] Walker, K.A., Stroh, P.A. & Ellis, R.W. (2017). *Threatened Plants of Britain and Ireland*. Botanical Society of Britain & Ireland, Bristol.

[548] Mountford, J.O. (1994). *Persicaria minor* (Hudson) Opiz. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

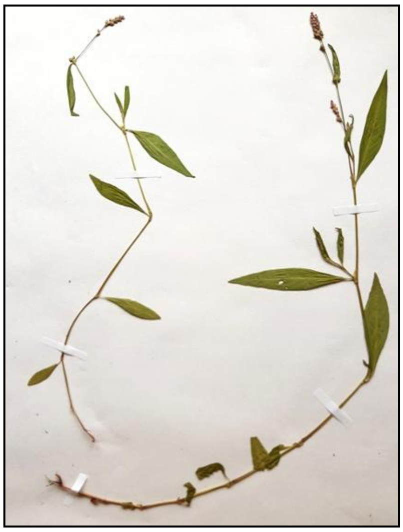
Persicaria mitis (Schrank) Assenov (Tasteless Water-pepper)

vc 15, gone from vc16

Rarity / scarcity status



Persicaria mitis is a local and often rare annual species in Britain and Ireland with scattered records from Southern England and Wales, north to Yorkshire and Cheviot. It appears with the name *P. dubia* in *BSBI Handbook No.3*[549]. It is regarded as **Vulnerable** to the risk of extinction both in Great Britain and in England. In England, this risk assessment is based on a reduction of its area of occupancy between the periods 1930-1969 and 1987-99 such that there is a 35% reduction in the likelihood of recording it. It is a declining, **nationally scarce** species of wet, unshaded, nutrient-rich mud and peat where it enjoys fluctuating water levels, which may be provided in habitats such as cattle poached areas of grazing marsh, shallow ditches, damp hollows and abandoned peat cuttings. It is threatened by drainage, by regulated water levels and by the erection of stock fencing which excludes cattle from ditch margins, thus preventing trampling. Recent records exist from our neighbouring counties of Surrey and Hampshire but in Kent it has been regarded as probably extinct in the absence of any finds since 1955. However, in September 2020 it was found by Sue Buckingham in the floodplain of the Little Stour, west of Preston. It is accordingly very **rare** in Kent.



Photos by Sue Buckingham, 10 September 2020

Account

In Hanbury & Marshall (1899), *Persicaria mitis* is listed as *Polygonum mite* Schrank and is described as a rare native species of ditches and wet places. It was first recorded in the county in 1855 by A. G. More[550] from a marsh below Fisher's Castle, Tunbridge Wells where one plant was growing amid a quantity of *Persicaria maculosa* (Redshank). Other nineteenth century records include finds by Anna Atkins at Lewisham (specimen in **BM)**; by F.J. Hanbury from Chislehurst Common and also from near Minster, Sheppey ; and (if correct) by Miss Peers, a single plant at Spring Field, Hadlow. The last West Kent record for *Persicaria mitis* is in 1955[551] by Miss C.A. Swain (incorrectly Swann in the BSBI database), det. F.H. Perring, from a clayey woodland path south west of Petts Wood station with a voucher specimen in **MNE**. The BSBI database allocates TQ4366 as the grid-reference; this may be so, but if it was retrospectively assigned to the location by virtue of its being Pokeridden Wood (as given in Francis Rose's manuscript *Flora of Kent*), then monads TQ4265, TQ4266 and TQ4365 are all possibilities as well. Rose also includes an undated record by J.P.M. Brenan from a wet ride in Angley Wood. No distinct pattern emerges from this distribution.

The few plants seen in September by Sue Buckingham were growing on mud in a small, somewhat disturbed area of cattle pasture beside a ditch in the Deerson Valley at TR 23659 60293. This may have previously been the site of a cattle feeding station. The flowers were bright pink and the plants' habit was suggestive of a slender and somewhat elegant *Persicaria maculosa* (Redshank) but without the conspicuous black marks on the leaves which are usual in that species. A specimen was collected, pressed, and later sent to the BSBI referee, Dr J. R. Akeroyd, who confirmed it as *Persicaria mitis*. Other plants noticed from the vicinity were *Cerastium fontanum* (Common Mouse-ear), *Carex riparia* (Greater Pond-sedge), *Carex spicata* (Spiked Sedge), *Helminthotheca echioides* (Bristly Ox-tongue), *Mentha aquatica* (Water-mint), *Ranunculus sceleratus* (Celery-leaved Buttercup) and *Sparganium erectum* (Branched Bur-reed).

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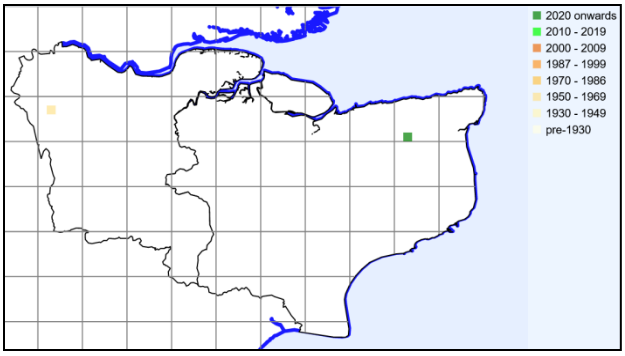
[549] Akeroyd J.R. (2014). *Docks and Knotweeds of Britain and Ireland (edn. 2*). Botanical Society of Britain and Ireland, London. The author (pers. comm.) since then has preferred *P. mitis* as name.

[550] More, A.G. *On some Uncommon Plants observed at or near to* Tunbridge Wells, Kent, *in* 1855. *Phytologist* (1855-56) N.S. **1**: 292-295.

[551] The London Ecology Unit has referred to a TQ4366 record in 1985, but this may be referring back to the earlier one.



Persicaria minor **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Deerson Valley is adjacent to and east of the Little Stour and west of the village of Preston. The land is low-lying, prone to extensive winter flooding and is intersected by numerous ditches which have an abundance of *Hydrochaeris morsus-ranae* (Frogbit) and a good range of other aquatics. The geology is alluvium overlain with seasonally wet deep clay. Typical habitat for *Persicaria mitis* is described as wet, nutrient-rich mud and peat that is exposed in the summer months as water-levels fall. In Wales, the best sites are said to be very damp and dynamic, with disturbance generated by trampling livestock at drinking holes[552]. Although conditions in Deerson Valley may be very suitable, other sites in the county would seem to be equally so, and it could be that this species is being overlooked.

Flowering is from June to September and reproduction is entirely by seed. Germination of viable seed requires bare warm wet soils and open conditions created by flooding and standing water in winter and spring, followed by a rapid drawdown in summer. As an annual, *Persicaria mitis* is a poor competitor unable to survive shading by tall emergent species. The fruit is a blackish-brown to black nut, 2.8-3.5(-4) mm long and fairly shiny. Studies have shown that wetland *Persicaria* seeds with their hard, smooth cases can well survive endozoochorous dispersal (passing undamaged through the gut of an animal or bird), and can thus be transported from one site to another. Within a site or catchment, seeds may be spread by winter flooding due to their buoyancy.

Persicaria mitis is somewhat similar to *P. hydropiper* (Common Water-pepper) in general appearance but, although mildly peppery, it is never acrid or burning to the taste[553]. The perianth glands are few (0-15, mean c.12 per flower); those of *P. hydropiper* are numerous (mean c.83 per flower). It also differs from *P. hydropiper* in its more erect and elegant inflorescence and its conspicuous purplish pink flowers rather than greenish or reddish-coloured. However, it has been observed that *P. mitis* flowers can vary to greenish-white[554]. It differs from *P. maculosa* in the perianth glands (absent in *P. maculosa*); the absence of a black spot on the leaves which *P. maculosa* normally has; and the narrow, somewhat interrupted inflorescence (dense and continuous in *P. maculosa*). *Persicaria minor* (Small Water-pepper) is a plant of similar habitats to *P. mitis* but differs by having much narrower leaves (usually not exceeding 8mm wide) and is a much-branched plant with a shorter, more erect inflorescence, eglandular perianth segments and smaller nuts not exceeding 2.5mm, mean c.2.2mm).

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[552] Stroh, P.A . 2015. *Persicaria mitis* (Shrank) Assimov. Tasteless Water-pepper. Species Account. Botanical Society of Britain and Ireland.

[553] With reference to the taste of *Persicaria species*, tasteless or not, note the comment in R.V. Lansdown, R.V. (2008) *A Field Guide to the riverine plants of Britain and Ireland*: 'it is extremely unwise to taste aquatic plants due to the risk of contracting water-borne diseases'.

[554] Akeroyd, J.R. (1998) *Persicaria*, riparian species, in (ed.) Rich, T.G.C. & Jermy. A.C. *Plant Crib 1998*. Botanical Society of the British Isles, London.

Peucedanum officinale L. (Hog's Fennel)

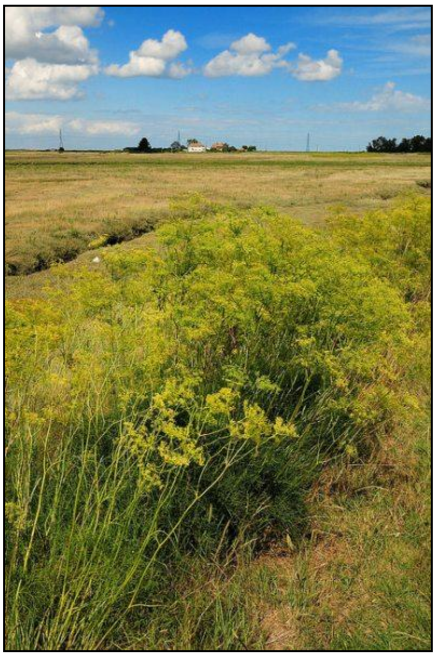
vc15, extinct in vc16 (if it ever occurred there)

Rarity / scarcity status

Hog's Fennel is in the British Isles confined to coastal banks, grassland and saltmarsh in East Kent, Essex and Suffolk. It is **nationally rare**, but its conservation risk category is one of 'Least Concern'. Its European distribution is extraordinarily disjunct: the nearest continental localities are at Cap Fréhel on the north coast of Brittany west of Dinard, and in Alsace. In Kent, it is **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Account

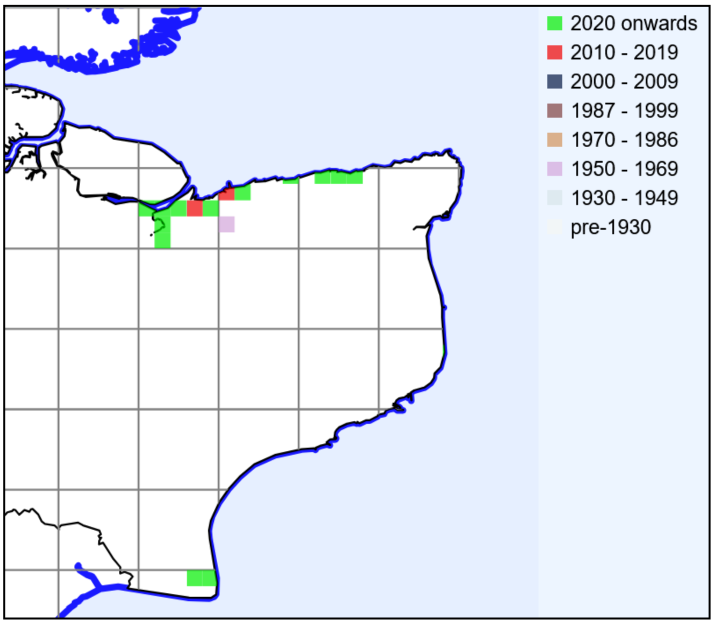
John Gerard, in his *Herball* (1597), gave the first British records for 'Sulphurwoort or Hogs Fennell', showing knowledge of both Kent and Essex sites (it was not found in Suffolk until 1990). As regards Kent, he stated that it 'groweth…at Whitstable in Kent in a medow neere to the sea side, sometime belonging to Sir *Henrie Crispe*, and adjoining to his house there. It growth also in great plenty at Feversham in Kent, neere unto the haven upon the bankes thereof, and the medows adjoining.'.



Faversham. Photo by Lliam Rooney, 31 July 2017

These are still the core Kent locations, although there is now more extended presence along the north Kent coast between Faversham and Birchington. There is no indication that it has grown elsewhere in the county other than a reference in John Ray's *Catalogus Plantarum Angliae* (1677) to it growing at '*the River Thames in many places*', which might well apply to West Kent. Given that there is no other such record, however, this must be regarded as questionable, although Hanbury & Marshall (1899) were of the view that 'The plant is quite likely to have grown by the river at that time, and to have become extinct owing to the erection of the existing high embankments and the drainage of the marshes'.

The distribution (for 2010-24 amounting to 16 tetrads, or 25 monads) is shown here, and, by and large this appears currently as extensive as it has ever been, if not more so. The status of the various populations is considered below in sections: Faversham; Faversham to Graveney Marshes; Seasalter / Whitstable; Whitstable / Tankerton to Swalecliffe and Herne Bay; Reculver to Birchington. Introductions are dealt with afterwards (Dungeness and Kingsdown/ Oldstairs Bay – this last population does not show well on the map, as the relevant tetrad, TR34Y, is 94% sea).



Peucedanum officinale **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Faversham

This is a much-visited and extensive population. Historic records include John Blackstone's *Specimen Botanicu*m (1746) in which he refers to it 'On the Sea-wall leading from *Feversham* to *Thorne*, abundantly' – this is where Thorn Creek meets the east side of Faversham Creek, and it still grows there, although much of section from there to the centre of Faversham has been developed since. It is also present along the continuation of the sea wall coastwards, and Hanbury and Marshall (1899) refer to comments by A. Wolley Dod that it could be found as 'Abundant on the east side of Faversham Creek from the brickfields [these were between Thorne Creek and Faversham] to Nagden'. A visit communicated to the *Phytologist* (1861) **5:** 107-113 under the title *An account of a few hours' Observations in and about the ancient town of Faversham, Kent* also described what the botanical tourist might see: 'But the pride and the glory of the Faversham Flora is the Peucedanum officinale, a plant in these isles, almost exclusively confined to Kent; and this is the better known of its two Kentish reported stations. We hesitated about going to Whitstable in search of it, but ultimately concluded that our time would be better spent in searching the coast further south. This rare species still grows plentifully on the high bank which skirts the creek on the Faversham side of the river. If the tourist goes on straight to the harbour, and then follows the dike towards the east, leaving the creek on his right, he will soon see plenty of this plant'.

Faversham. Photo by Lliam Rooney, 23 July 2008

There are many later records, not adding a great deal of information other than simple presence, the most informative including:

- An estimate by Rosemary FitzGerald and C. Appleby on 14 June 1985 of as many as 10,000 plants along the seawall, TR 023 622.
- A count in 1989 communicated by Hector Wilks, of 8,000 plants for TR0262 and TR0362, but including the area enclosed as part of the old Nobel explosives factory only insofar as could be estimated by looking over the fence.
- G. Thornton, 1990, sightings at TR 023 619; TR 023 620; TR 024 620; TR 025 620; TR 025 621; TR 026 622; TR 028 624; TR 029 625; TR 030 625; TR 031 625 (these range from the outskirts of Faversham, beyond Thorn Creek but not as far as Nagden).

Some 2010-24 records are included in the data table below.

[Note: in this and subsequent data tables, only a selection of recent records is included.]

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Oare Marshes west	TR0064	SSSI	15 May 2023	LR & CW	TR 00981 64979, seawall, Swale west of Harty Ferry.
Faversham Creek south	TR0262	SSSI	(1) 20 April 2021 (2) 10 May 2014 (3) 5 May 2014 (4) 18 August 2010 (5) 30 April 2010	(1) CW (2) GK (3) GK (4) SB (5) GK	(1) Iron Wharf to mouth of Thorn Creek (noted as along sea wall on 13 April). (2) Still present along south side of creek from TR 0236 6213 to TR 029 625, with occasional gaps, sometimes in great abundance and locally dominant. (3) TR 02824 63373, several plants on sea defence embankment, west side of creek.

					(4) TR 02365 62136, plants ± continuous and closely spaced on both slopes of sea wall, Saxon Shore Way, for 300m. Then TR 02859 62442, plants ± continuous similarly northwards for 600m. (5) Many hundreds of plants by creek from TR 0236.6213 to TR 0300 6253 and beyond, also branch creek to TR 0235.6192, in rough tussocky grassland, except absent from a short section TR0266.6231 to TR0281.6239, less common further north.
Faversham Creek – Nagden Marshes	TR0263	SSSI	(1) 20 April 2021 (2) 5 May 2014	(1) CW (2) GK	(1) near Nagden (noted as along sea wall on 13 April). (1) TR 02824 63373, several plants on sea defence embankment, west side of creek, downstream of Nagden.
Faversham Creek Sandbanks	TR0362	SSSI	(1) 20 April 2021 (2) 10 May 2014 (3) 5 May 2014 (4) 15 August 2010 (5) 30 April 2010	(1) CW (2) GK (3) GK (4) SB (5) GK	(1) Thorn Creek to Nagden (2) Scattered along east side of creek, including TR 033 628, and most northerly on a grassy bank at TR 0328 6595. (3) TR 0303 6296, on grassy sea defence embankment, west side of creek. (4) TR 03279 62972 , Faversham Creek, east bank, south of Nagden Cottages, Plants densely spaced and continuous on grassy banks of sea wall (Saxon Shore Way) southwards for approx 170m. (5) Scattered plants alongside Faversham creek (east side) on or by rough grassy bank at least from TR 0300 6253 to TR 0310 6257.
Faversham Creek, Nagden	TR0363	SSSI	(1) 20 Apr 2021 (2) 14 March 2013	(1) CW (2) LR	(1) near Nagden (2) Scattered plants along the west side of Faversham Creek along the Saxon Shore Way.

Faversham. Photo by Lliam Rooney, 23 July 2008

Faversham to Graveney Marshes

These are scattered plants running from the mouth of Faversham Creek towards Whitstable Bay; but the western section (TR0364, TR0464 and TR0564) does not seem to have records before 2010.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Castle Coote	TR0364	SSSI	(1) 26 April 2020 (2) 27 May 2011	(1) CW (2) LR	(1) 2 plants (2) TR 03744 64642, one plant, behind the sea wall, by the South Bank of The Swale Nature Reserve (Castle Coote).
Cleve Marshes	TR0464	SSSI	(1) 15 September 2021 (1) 12 August 2010	(1)KBRG meeting (1) GK	(1) Single plants on landward slope of sea wall at TR 0417 6477 and TR 0483 6493 and TR 0499 6491. (1) TR 04999 64911, behind estuarial wall.
Cleve Marshes	TR0564	SSSI	(1) 20 August 2022 (2) 19 August 2021 (3) 7 August 2011	(1) AL (2) RM (3) KFC meeting	(1) TR 0557 6481. One clump below the path by the first fence. (2) TR 055 648. (3) TR 0556 6482.
Graveney Marshes	TR0664	SSSI	(1) 12 May 2024 (2) 21 July 2010	(1) & (2) LR	(1) Two plants on seawall, TR 0571 6482. (2) TR 0625 6478, Faversham Road near the Sportsman Pub: several plants.

Seasalter/Whitstable

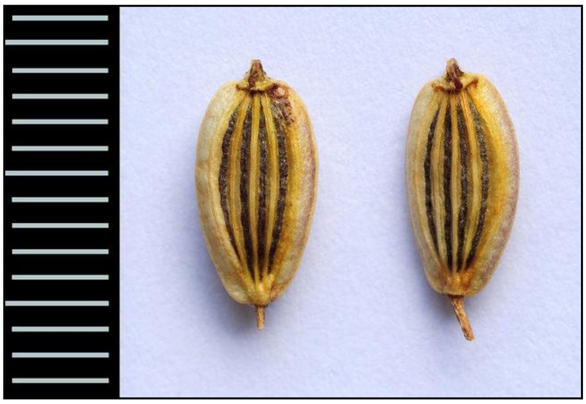
Records from Seasalter go at least back to 1889 (specimen in **CGE** collected by G. Dowker). Historic records for Whitstable may relate to the TR0965 location, but where any detail is given on nineteenth century herbarium labels, they seem more likely to relate to the coast east of Whitstable, including Tankerton and Swalecliffe, dealt with separately below. The original Gerard site at Whitstable, the meadow near the sea side at one time belonging to Sir Henry Crisp (died 1575) and adjoining his house, appears from Hasted's *History and Topographical Survey of the County of Kent* (1799) to have applied to a place called Grimgill. A farm of this name (or Crimgill) exists on 18th and 19th century maps (located in TR1065), and was nearer the influence of the sea in Gerard's time, when Lower Island was separated from Whitstable Street by the Salts.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Seasalter	TR0864		29 September 2011	CO	Along roadside.
Seasalter	TR0865		(1) 02 June 2022 (2) 29 July 2017 (3) 23 June 2012 (4) 1989 (5) 7 August 1985 (6) c. 1974	(1) AL (2) AL (3) LR (4) comm. HW (5) RF (6) Philp (1982)	(1) TR 0823 6501. Several plants; increasing. (2) TR 0823 6501, behind the sea wall at Seasalter. (3) TR 08223 65020. 10+ plants on a wide roadside verge, Faversham Road, Seasalter. (4) 7 plants. (5) TR 083 650, on dry roadside bank near sea wall by caravan site: a patch 2.7m x 8.8m containing seven plants of which four were in flower; not in good condition as bank had been mown. Associated species: *Centaurium erythrea, Daucus carota, Linum bienne, Trifolium pratense, Helminthotheca echioides, Leontodon saxatile, Senecio jacobaea, Hypochaeris radicata, Plantago lanceolata, Festuca rubra, Holcus lanatus, Cynosurus cristatus.* (6) Given as TR06X, but was the

					same site as last.
Seasalter / Whitstable	TR0965		(1) 1990 (2) 1989 (3) 24 September 1985	(1) GTh (2) comm. HW (3) RF	(1) TR 097 655. (2) One plant, TR 097 655. (3) TR 097 655, one plant with fruiting stems on a rough grassy bank on the landward side of the sea wall between Whitstable and Seasalter. Associated species were: *Senecio erucifolius, Lotus corniculatus, Lepidium draba, Trifolium pratense, Rubus caesius, Helminthotheca echioides, Festuca rubra, Lathyrus nissolia, Daucus carota, Rumex crispus*.

Whitstable/Tankerton to Swalecliffe and Herne Bay

This has long comprised a major population, or series of populations, based on the slopes running down to the sea either derived from, or still constituting, slumped London Clay cliffs. *Peucedanum* was noted by the Rev. W. Wood at the undercliff between Whitstable and Herne Bay (given in Matthew Cowell's *A Floral Guide for East Ken*t, 1839); but literature references are greatly outnumbered by collected specimens. The more informative herbarium labels tell us: 'Undercliff on broken ground, between Whitstable and Stud Hill Bay' (A. Bennett, 1873); 'Tankerton Bay, Whitstable to Herne Bay…Abundant towards "The Rock" [=Long Rock?]' (S. Wood & W. West, 1897); 'Broken ground near the sea near Whitstable' (J. Groves, 1902); 'London Clay Cliffs E of Whitstable' (A.O. Hume, 1903); 'Extremely abundant on the slopes facing the sea at Tankerton, near Whitstable' (J.E. Lousley, 1930); 'Tankerton Cliffs E. of Whitstable. Slipped London Clay cliffs' (Francis Rose, 1950). This abundance was affected by drainage schemes which began in the 1920s and 1940s, with a particularly damaging scheme put forward in the 1960s involving 'landscaping' and drainage which destroyed about half of the *Peucedanum* population. The remaining patches owe much to lobbying by Hector Wilks of the (then) Kent Trust for Nature Conservation and have since been protected by SSSI status, designated because of the *Peucedanum* population. Subsequent drainage works have been more circumspect, as needing to take account of approvals required by that status, and there is evidence that seedling appearance has increased after approved drainage works. In 1986 at the instigation of the owners, Canterbury City Council, some 400,000 seeds and many container-grown plants were planted out in trial plots on the slopes. The seed was obtained from Tankerton in 1985, and treated in Wye College to encourage germination. However, the transplants and seeds apparently did not establish well in areas where there was existing vegetation. Whether because or in spite of these attempts, the total population in 1989 was assessed at 2,500 (TR1167 and TR1267). The slopes are currently managed by Canterbury City Council under a management plan[555] which attempts to reconcile a wish to ensure that instability does not result in regression of the top of the slopes into the amenity land and roadway above against the conditions which suit *Peucedanu*m, an environment of tension cracks and shallow surface movements. These aims are not necessarily consistent: the area of the slopes with the most *Peucedanum* is opposite Pier Avenue and apparently has no drainage.



Seeds. Photo by Lliam Rooney, 10 September 2012

Further east of the Tankerton slopes, the coast juts out at Long Rock, Swalecliffe. This area held many plants in 1897, and there appears to have been an inland presence as well, in rough pastures on clay, ½ mile south west of Swalecliffe church (E.C. Wallace, 1945). There were still a couple of Long Rock plants in 1960, when recorded by Hector Wilks (salting north of Kite Farm), and more recent sightings are given in the data table below.

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[555] *Queen Elizabeth II Diamond Jubilee Field: Tankerton's Coastal Park Management Plan 2014-2024*. Canterbury City Council. This includes management actions such as the removal of encroaching scrub; hand-pulling *of Smyrnium olusatrum* (Alexanders); limited mowing alongside footpaths, avoiding damage to *Peucedanum*; and leaving an unmown buffer zone at the top of the slopes.

There are old records further east along the coast, at Herne Bay: a specimen collected by W. Christy (**CGE**, 1838) and a reference in James Smith's *English Flora,* vol. 2, 1824 ('on a cliff, by the sea, at Hearn, 6 miles from Whitstable. *Mr. Crow of Feversham*.'). Marshall in the *Victoria History of the Counties of England: Kent* (1908) considered it was still there. Plants in this area were thought perhaps to have long been lost to erosion, but were found by Colin Osborne to be present in 2021.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Whitstable/West Tankerton	TR1167	SSSI	(1) 18 August 2010 (2) 29 July 2010	(1) & (2) SB	(1) TR 11990 67314, Tankerton Slopes, spread of plants c. 450m eastwards (into TR1267) on grassy clay slope, 50m above the promenade, sometimes very densely spaced with 7-8 plants per 10m and also with gaps of no or very few plants. Plants terminate where beach huts begin at TR 12391 67321. Kent Wildlife Trust keeps the slope clear of invasive *Smyrnium olusatrum*. (2) TR 11958 67295, c. 70 plants on clay slope above promenade.
Tankerton	TR1267	SSSI	(1) 28 September 2019 (2) 9 April 2015 (3) 18 August 2010	(1) AW (2) JP (3) SB	(1) TR 123 673, Tankerton Slopes. (2) Survey of slopes and beach below Marine Parade. Several young plants now on edge of shingle. (2) TR 12128 67324, Tankerton Slopes, Spread of plants (from TR1167) c. 300m eastwards, details as above in relation to TR1167.
Swalecliffe	TR1367	SSSI	(1) 13 May 2023 (2) 9 September 2021 (3) 182 August 2021 (4) 28 June 2011 (5) 1990 (6) 1989 (7) 31 December 1987	(1) KFC meeting (2) BB (3) CO (4) LR (5) GTh (6) comm. HW (7) RF & JPtt	(1) TR 13730 67697. (2) rare in MG1a coastal neutral grassland, centre point TR 13535 67558. (3) Well grown plants on Long Rock SSSI. (4) TR 1369 6754. 20+ plants at Swalecliffe. (5) TR 136 675. (6) 37 plants at TR 136 675. (7) TR 1366 6754 [inferred]. Over 20 plants on ditch bank bordering disturbed ground. Associated species: *Anthriscus sylvestris*, *Artemisia vulgaris,* *Cirsium arvennse,* *Dactylis glomerata,* *Daucus carota,* *Elytrigia repens,* *Melilotus* sp., *Pastinaca sativa,,* *Helminthotheca echioides,* *Senecio erucifolius.*
Herne Bay	TR1868		(1) 19 July 2022 (2) 16 July 2021 (3) 2 May 2021	(1), (2), (3) CO	(1) Two plants adjoining top path at c. TR 188 683 plus four above promenade centered on c. TR 188 684 (2) 0ne large plant at Downs top at c. TR 188 683; three large plants plus one small just east of Coastguard Watch Hut. (3) Two patches of one and four

					plants just east of Coastguard Watch Hut, edge of slopes in proposed location for new beach huts.
Herne Bay, Beltinge	TR1968		6 May 2018	CO	One new plant behind sea wall at c. TR 1925 6845.

Reculver-Birchington

There are no early records for the coastline between Reculver and Birchington up to and including the 1971-80 survey of Philp (1982). The first appears to have been Rosemary FitzGerald's visit to Minnis Bay in 1987, when over 30 plants were seen around the sea defences. It has since been recorded in five tetrads and appears to be spreading.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Reculver	TR2369	SSSI	(1) 25 August 2021 and 13 June 2020 (2) 9 September 2010 (3) 29 July 2010	(1) CO (2) CO (3) SB	(1) c. 8x6m patch at base of seawall (2)One plant on slope of sea wall. Recent colonist from Coldharbour (TR2569). (3) One plant each on landward slope of sea wall at TR 23432 69426, TR 23778 69430, TR 23979 69428, TR 23993 69429.
Knock Point, Reculver	TR2469	SSSI	(1) 25 August 2021 (2)12 April 2016	(1) CO (2) SB	(1) - (2) Single plant at TR 24300 69401.
South of Coldharbour lagoon	TR2568		(1) 2 July 2013 (2) 2 August 2010	(1) CO (2) SB	(1) Inland, near junction of railway embankment and track to sea, one plant. (2) One plant each on grassy bank by dyke, TR 25110 68738, TR 25170 68920.
Coldharbour lagoon	TR2569	SSSI	(1) 25 August 2021 (2) 29 July 2010 (3) 16 August 1987	(1) CO (2) SB (3) RF & HF	(1) - (2) (a) TR 25205 69263, dense stand of plants >80m x 10m. (b) TR 25224 69244, dense stand >100m x 25m on grassy bank of sea wall, south facing. (c) TR 25306 69262, plants scattered for further 70m eastwards on north facing side of sea wall. (3) TR 2525 6924 [inferred], over 30 plants scattered around the junction of embanked paths (sea defences) from railway and along coast, south of lagoon. Associated species: *Achillea millefolium, Cirsium arvense, Daucus carota, Elytrigia repens, Heracleum sphondylium, Melilotus alba, Medicago lupulina, Ononis spinosa, Pastinaca sativa, Picris hieracioides, Phragmites australis, Rumex crispus, Sonchus arvensis, Senecio erucifolius, Tripleurospermum maritimum.*
North of Wade Marsh	TR2669	SSSI	(1) 24 June 2021 (2) 5 September 2013 (3) 23 September 2011 (4) 30 September 2010	(1) CO (2) CO (3) CO (4) SB	(1) - (2) One patch at eastern end on landward side of seawall at c. TR 267 692. (3) One plant on seaward side of seawall at diversion round lagoon c. TR 267 692. (4) TR 26746 69196, seven plants, top of landward side of sea wall.

Reculver to Birchington. Photo by Sue Buckingham, 2 August 2010

Introductions

In 2023-24 it became apparent that plants were also present on the east coast. A young plant was found by Owen Leyshon in May 2023 at Lydd-on-sea, TR 08807 19274, which flowered and seeded in 2024. Then there are two further plants which have appeared in 2024 on the Dungeness RSPB reserve. One was in the edge of the Hanson/ARC car park, TR 06306 19746. The other was by a bramble bush on the bridleway and edge of the sandy track at Hookers Pit, TR 06043 18855. It appears that the RSPB have used a heavy machinery company to grade the main track into the reserve. It is possible that this is the same company which was earlier working in the Old Rifle Range at Kingsdown, where Steve Coates in April 2024 found six plants by road rubble dumped on vegetated beach shingle, TR 38039 47756. This last location is close to where *Bupleurum tenuissimum* (Slender Hare's-ear) was discovered in 2023. As *P. officinale* has been until now a north Kent coastal plant and the habitat and range of *B. tenuissimum* overlaps considerably, it is likely that both species have been brought to the Kingsdown SSSI from the Thames estuary.

The restriction of Hog's Fennel as an apparent native to the north Kent sites and coastal Essex and Suffolk suggests that a Continental climate favours the species, with relatively high summer temperatures and coastal prolongment of the growing season being required for seed to ripen fully. Our sites are on London Clay, most frequently on embankments, but also on damp ground below. It may be that the embanked clay habitats provide opportunities for seed establishment where summer baking of the clay opens up crack and winter rain erodes; and the classic slumping clay cliff habitat offers similar opportunities, due also to instability from drainage-related movement. It appears that Hog's Fennel grows typically where the summer water table is near the surface or less than 50cm below, but our embankment plants grow well where this is unlikely to be the case, which may be due, at least when established, to the massive and far-reaching tap root. Our plants on lower ground are clearly capable of tolerating the saline conditions of upper saltmarsh; this is particularly evident along parts of Faversham Creek.

The *Biological Flora of the British Isl*es account[556] mentions plants at Tankerton slopes as being the tallest in Britain, with many plants over 2m high and bearing as many as 50 flowering stems per plant in 1990. These large clumpy plants may be of considerable age and although there is no direct evidence of life expectancy, a sample mature plant excavated has been considered to be at least 25 years old. Shoots may emerge through root extension up to 50cm from a mature plant. Hog's Fennel may also spread by seed, with potential for up to 500,000 seeds from the largest plants. It is tempting to think of coastal spread as occurring by water, such as with the tides along Faversham Creek and thence into the Swale. But the seeds apparently have a flotation time of 4-6 days if undisturbed and this does not seem capable of affording any satisfactory explanation of coastal spread: the only young plants on shingle which have been noted recently have evidently spread from the land above, and most of our plants (except, perhaps, for Faversham) are on banks or cliff slopes, where spread of seed by wind is more relevant. But it is of course possible for seed which has fallen into the water of ditches and sunk to be spread on ditch banks in the course of ditch clearing. Similarly, coastal defence maintenance or construction works resulting in the movement of soil may distribute seed or rootstock.

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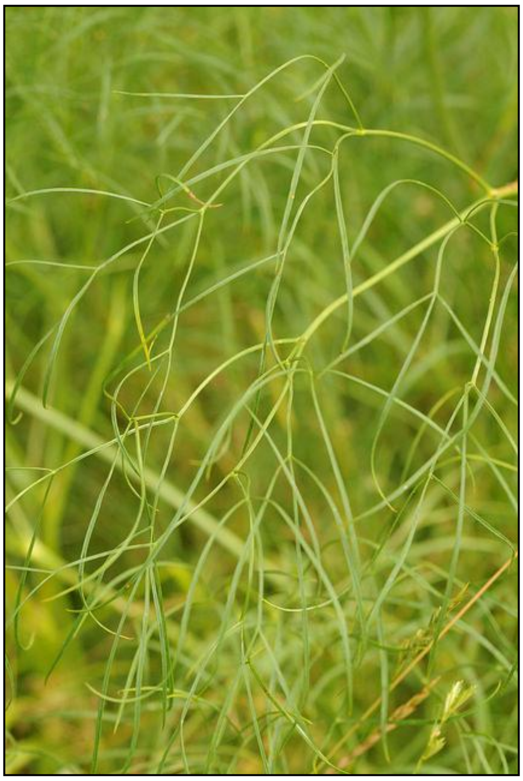
[556] Randall, R.E. & Thornton, G. (1996). Biological Flora of the British Isles: *Peucedanum officinale* L. *Journal of Ecology* **84**: 475-485.



Faversham. Photo by Lliam Rooney, 23 July 2008

Peucedanum officinale is the sole host plant in Great Britain for larvae of the micromoth *Agonopterix putridella*, recorded at Tankerton Slopes and Coldharbour. *Gortyna borelii lunata* (Fisher's estuarine moth) uses it as its main host plant and about 20% of moth's UK population is at Tankerton/Swalecliffe.

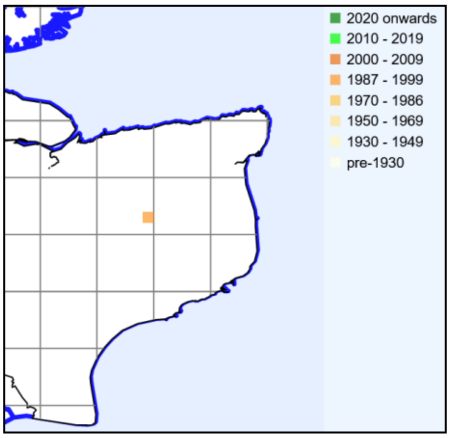
It is unlikely that *Peucedanum officinale* will be confused with any other British plant, except perhaps for *Foeniculum vulgare* (Fennel) which can occupy similar coastal habitats but which is less robust and has filiform (rather than linear) leaflets which smell of aniseed when crushed.

Phelipanche purpurea (Jacq.) Soják (*Orobanche purpurea* Jacq.) (Yarrow Broomrape)

vc 15

Rarity / scarcity status

Phelipanche purpurea is a nationally rare and very local Broomrape, parasitic on *Achillea millefolium* (Yarrow), with a scattered distribution including Pembrokeshire, Norfolk and the Isle of Wight. It is treated as **Vulnerable** to the risk of extinction in England and Great Britain as a whole, but it is possible that up-to-date data could lead it to be reclassified as Endangered in England. It has been known for a very long time at one site in East Kent, although not recorded there since 1992, so it is either extremely rare in the county, or may be removed from the register as probably extinct.



***Phelipanche purpurea* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Account

Remarkable persistence was shown by this plant given that it occupied the same Kentish station for at least 170 years from first publication. In *The Magazine of Natural History* ('conducted by J.C. Loudon') (1830) **3**: 435, an anonymous correspondent from Bishopsbourne wrote to mention the spontaneous appearance of 'what I suppose to be the *Orobanche caerulea*, and which, in the year 1821, I found abundantly in some of the low pastures, and also some specimens in an elevated dry chalky situation at Bishopsbourne, in Kent. I had for many years preceding been an assiduous collector of plants in this and various parts of Kent, and never before saw it, nor have I met with it again, although my attention has been directed to the fields in which I found it'. It is curious that the knowledge of this occurrence seems to have sunk: Hanbury and Marshall were apparently unaware of the species as a Kent taxon. Jocelyn Brooke came to live in what was originally his family's summer residence at Bishopsbourne, and became aware of the Broomrape, at least by 1955[557]. Francis Rose saw it in that year and in 1958, when it was plentiful on *Achillea millefolium* in neglected allotments in Bishopsbourne village. Part of the rough field was ploughed in 1958. Afterwards in that year and in 1959, the plant was much more abundant in the section of field that had been ploughed than that which had been left. In 1960 the field had been set to grass and the Broomrape was not seen; in 1961 there was one plant by a hedge; in 1962, none. Again, the Broomrape fell out of view, but Philp (2010) notes that there were 21 flowering spikes in 1991 (*Orobanche minor* was also present) and with a few in 1992 but none since. From aerial photographs, the area east and south east of the village hall which in the 1940s was used as allotments had contracted by 1960 and has diminished considerably since then, most being laid to grass or overgrown.

It is an erratic and declining species in the British Isles, found mainly in dry, unmanaged and slightly basic grasslands and may cope with quite rank swards. Despite a preference for undisturbed ground, it is also found in disturbed habitats which perhaps better suits the Kent habitat description in later years. It is thought that the seed can remain viable for long periods in the soil.

Phelipanche purpurea is readily separated from other Broomrapes. The stem is distinctively tinged bluish, and the corolla is generally bluish-purple, flushed yellow towards the base. In side view, there is an appearance (on each side) of three calyx teeth, although one of them is a bracteole - there being two bracteoles, one each side of the corollas, and a larger bract underneath (other British Broomrapes have no bracteoles and so are placed in the genus *Orobanche* rather than *Phelipanche*).

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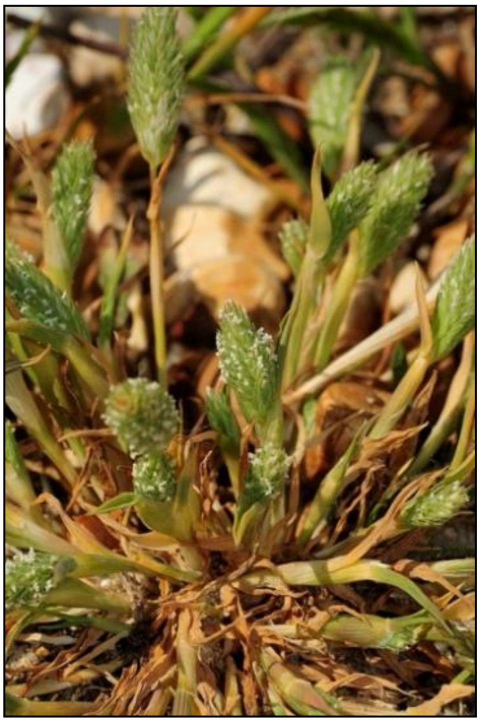
[557] Record given in *Proc. BSBI* (1956) **2**:36; and in Rose, F. (1960), Botanical Records for Kent, 1955-58 – Vascular Plants. *Kent Field Club Transactions* 1: 56-65.

Phleum arenarium L. (Sand Cat's-tail)

vc15 and 16

Rarity / scarcity status

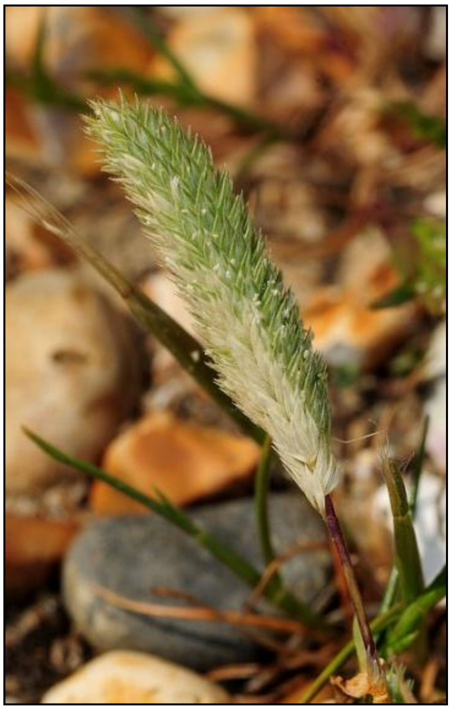


Sand Cat's-tail is a generally coastal grass, widespread around the British Isles on sand dunes and sandy shingle, except for north and west Scotland. Its threat level for conservation purposes is one of 'Least Concern' in Great Britain as a whole, but an assessment for England treats it as **Near Threatened**, on account of its area of occupancy having been taken to have declined by 27% in comparing records for the periods 1930-69 and 1987-99. In Kent it is restricted in its distribution and is near scarce. It is a Kent axiophyte and so is indicative of good habitat.

Littlestone. Photo by Lliam Rooney, 5 June 2010

Account

The first Kent record is 'Betwixt *Deal* and *Sandwich*' in Christopher Merrett's *Pinax rerum naturalium Britannicarum* (1666), which has remained its most abundant locality since. Hanbury & Marshall (1899) regarded it as a grass of maritime sands; rare, but locally plentiful. They mention it as on the north coast east of Whitstable; on the east coast still near Sandwich and with scatterings further south at Hythe, Sandgate, Lydd, New Romney and Dymchurch. Francis Rose described it as growing on sand dunes, particularly on looser sand; rare, but locally abundant. His locations were the shell sand beach at Shellness, Sheppey (1945-62), and Seasalter beach on the other side of the Swale (1951); Deal links (1954) and Sandwich Bay to Shellness, Pegwell Bay, where it was abundant on loose sand but rarer on fixed dune sand (1945-63); and along the south east coast at Greatstone dunes, Littlestone beach and near Romney Warren (1945-62).

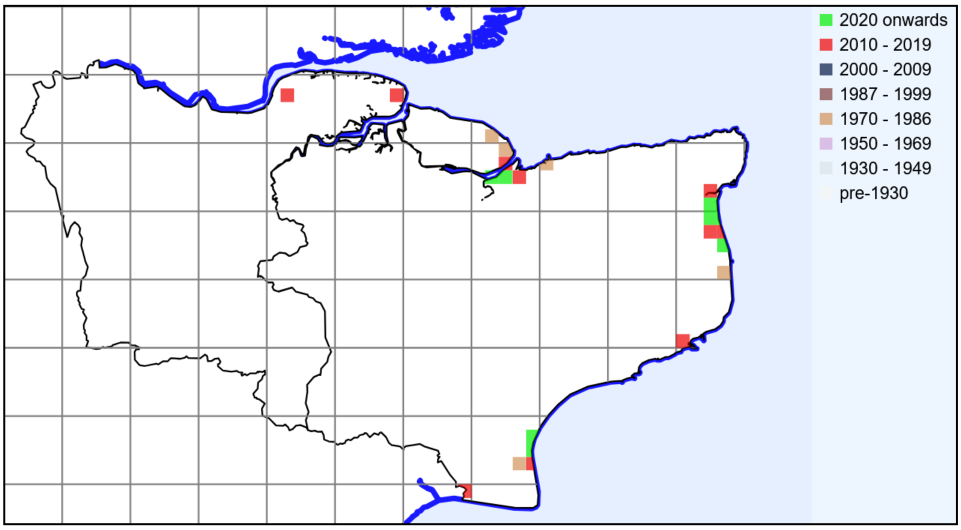


These locations are more or less replicated in Philp (1982), with a total of 21 tetrads recorded, including an additional site at Grain south beach. This total had reduced by the time of the 1991-2005 survey published as Philp (2010), with a lack of any records on Sheppey or at Grain. However, this appears to have been a consequence of survey limitations rather than actual decline, as our 2010-24 records restore the position to 18 tetrads (25 monads).

Littlestone. Photo by Lliam Rooney, 5 June 2010

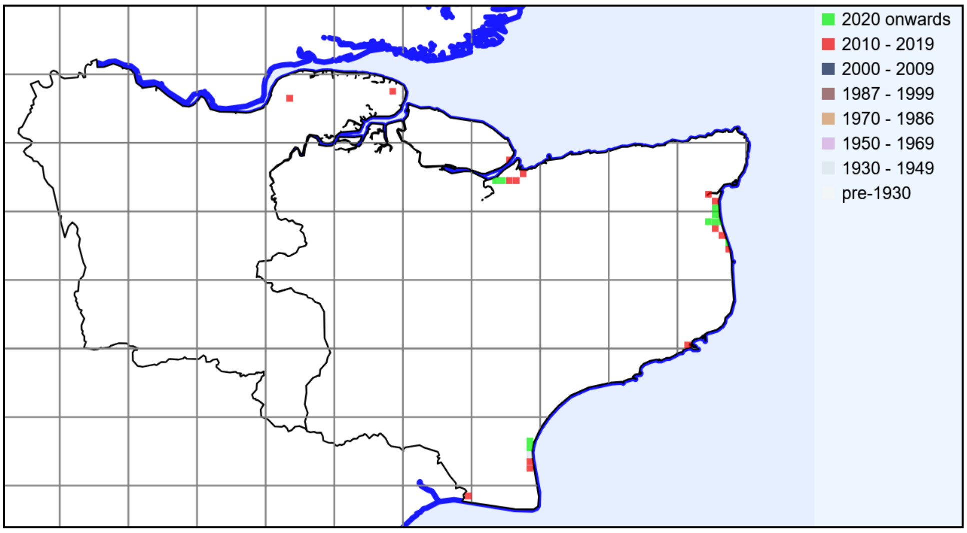
The limitations on *Phleum arenarium* records are mostly those of availability of suitable habitat, but there are also considerations of access, the north Grain (2017) and Lydd ranges (2012) records being products of permitted surveys on MOD land. A new location, at the coastal lakes of Cliffe, was discovered by Joyce Pitt in 2014.

Mapping is given below separately at tetrad and monad resolution, as the former displays historic records more fully, given that tetrad recording was the norm in Kent 1970-2009 and monad recording from 2010 onwards. From the tetrad records not re-found recently, it appears that the sands on the east coast of Sheppey are most likely to afford scope for re-discovery.


🟩 2020 onwards
🟥 2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

***Phleum arenaria* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Mapping is given here separately at tetrad and monad resolution, as the former displays historic records more fully, given that tetrad recording was the norm in Kent 1970-2009 and monad recording from 2010 onwards.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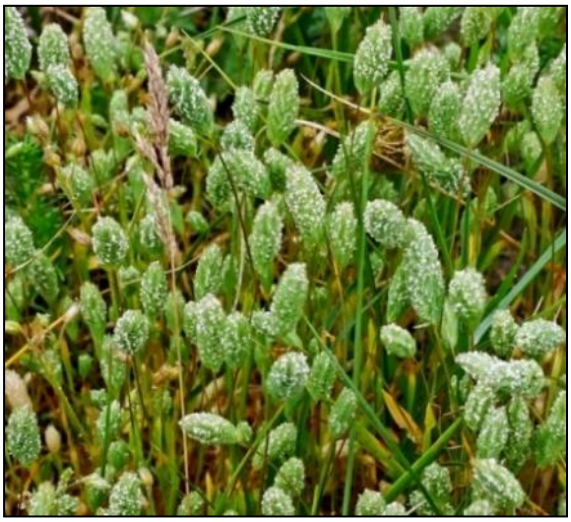
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

***Phleum arenaria* Kent records to 2024 mapped at monad level, from BSBI database.**

Phleum arenarium is an annual, whose seed germinates in late summer/autumn when sand temperatures drop below 10°C and sufficient moisture is present and remains. Subsequent drought may be lethal, so a dry spring can have a catastrophic effect on the appearance of this grass, whose seedlings overwinter close below the sand surface. In its coastal sand habitat, with its neat panicle, it is not readily mistaken for anything else, and it is the only annual amongst the British *Phleum* species, losing its greenish colour soon after maturity and drying to a straw-yellow.

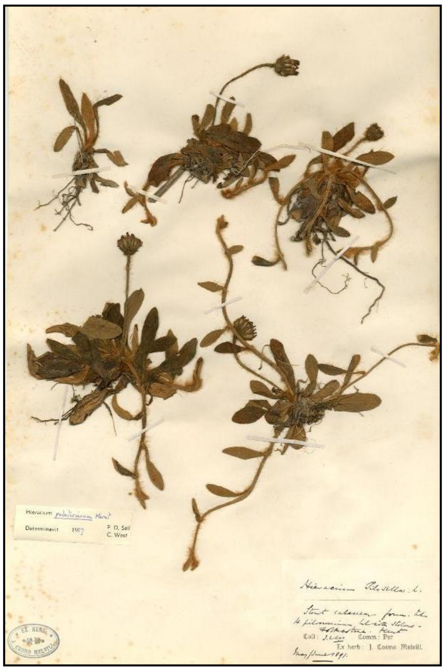


St. Mary's Bay. Photo by David Steere, 23 May 2023

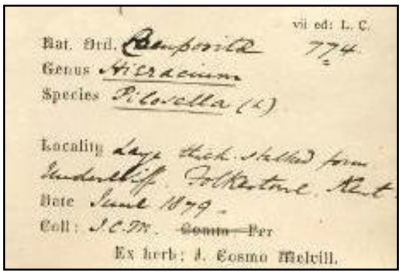
Pilosella peleteriana (Mérat) F.W. Schultz & Sch. Bip. (Shaggy Mouse-ear-hawkweed)

vc15

Rarity / scarcity status



Pilosella peleteriana is a creeping perennial, common on granite in the Channel Islands, but on the mainland very local on steep, well-drained, often calcareous slopes. It is **nationally rare**. There are three subspecies, of which subsp. *peleteriana* grows in Dorset and on the Isle of Wight; it has also been recorded in East Kent, but is generally supposed to be extinct. However, this account is predicated on the basis that this is not the case although, if present, it will be very **rare** in Kent. In Great Britain as whole it is assessed as **Near Threatened** for conservation risk purposes, albeit of 'Least concern' in England in the absence of sufficient mapping data.



vii ed: L. C.
Nat. Ord. Compositae 774
Genus Hieracium
Species Pilosella (L)

Locality Large thick-stalked form Undercliff Folkestone Kent
Date June 1879.
Coll: J.C.M. ~~Comm~~ Per
Ex herb: J. Cosmo Melvill.

Account

Neither Hanbury & Marshall (1899) nor Philp (1982) recognised the species as Kentish. Philp (2010), without further detail, referred to it as having been recorded from the Folkestone-Dover area in the past, but not found in the 1991-2005 survey. Therefore, what is known about the plant in Kent has to be pieced together from records.

There is a series of specimens at the National Museum of Wales collected from Folkestone over some years by the Manchester-based botanist J. Cosmo Melvill, and labelled *Hieracium pilosella* which were re-determined as *Pilosella peleteriana* by Peter Sell and Cyril West in 1957. The first was gathered in June 1879 as a 'Large thick-stalked form. Undercliff, Folkestone, Kent'. A further gathering was made in May/June 1891 as 'Stout calcareous form, like *H. pilosissimum* but with stolons. Folkestone, Kent'. A third gathering, in September 1893, is labelled as a variety of *Hiercium pilosella*, 'In chalk & gault, Undercliff, Folkestone, E. Kent'.

These specimens, located by Tim Rich, make it clear that the statement in the *Hybrid Flora of the British Isles*[558] that there are no confirmed records from the Folkestone area is incorrect. That statement was made in the context of an account of the hybrid *Pilosella peleteriana* x *officinarum*, for which it appears there is a record from Folkestone by the Rev. F.R. Tennant in 1890. The other parent, *Pilosella officinarum* (Mouse-ear-hawkweed), is abundant along the Folkestone cliffs. The (incorrect) statement about the absence of *Pilosella peleteriana* from Folkestone is also made in relation to the hybrid record by the Flora of Great Britain and Ireland[559], somewhat surprisingly given that Peter Sell was the author of the statement and the co-determiner of Melvill's specimens. The hybrid specimen, in **CGE**, is perhaps a further pointer to the early locations for *Pilosella peleteriana*, having been found at Folkestone cliffs above Old Pepper Rock eastwards. This last location has not yet been traced, but the references to chalk and gault and to the undercliff suggest Folkestone Warren would have been a site for *Pilosella peleteriana.*

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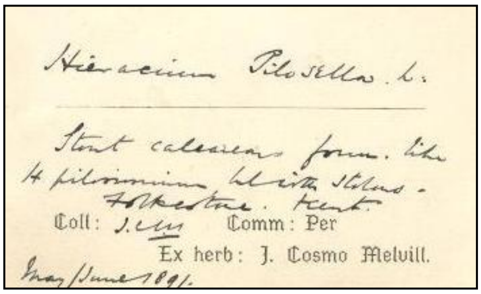
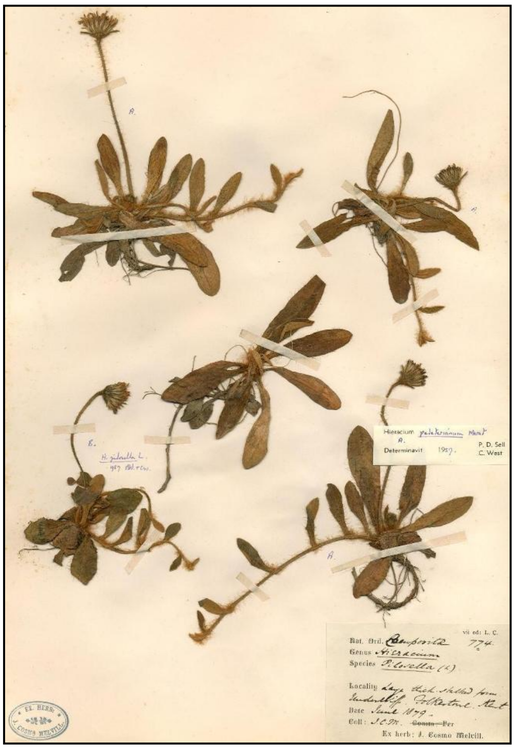
[558] Stace, C.A., Preston, D. & Pearman, D.A. (2015). *Hybrid Flora of the British Isles*. Botanical Society of Britain & Ireland, Bristol.

[559] Sell, P. & Murrell, G. (2006). *Flora of Great Britain and Ireland*, vol. 4, Cambridge University Press, Cambridge.

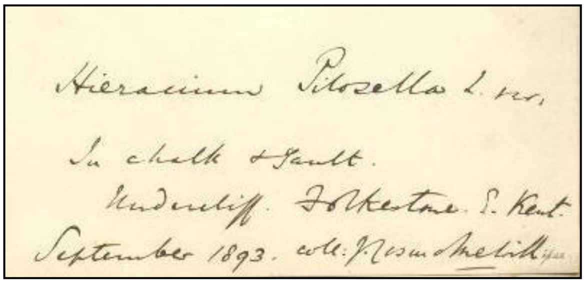

Hieracium Pilosella. L.

Stout calcareous form. like H pilosissimum but with stolons. Folkestone. Kent.
Coll: J.C.M. Comm: Per
Ex herb: J. Cosmo Melvill.
May/June 1891.

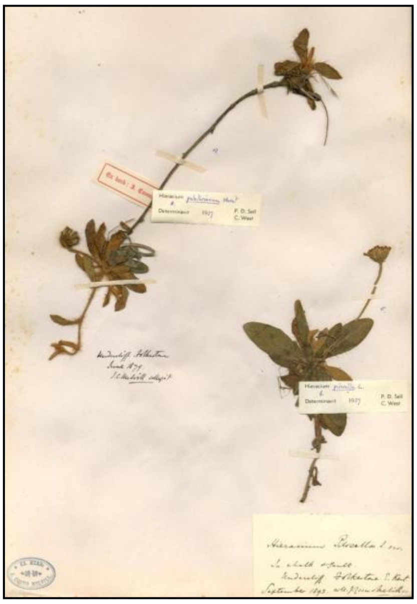
It is possible that *Pilosella peleteriana* may also have been known from the Lympne escarpment SSSI, but no specimen or record detail has been traced.


Hieracium peleterianum Merat
A.
Determinavit 1957.
P. D. Sell
C. West
vii ed: L. C.
Nat. Ord. Compositae 774
Genus Hieracium
Species Pilosella (L)
Locality Large thick stalked form Undercliff. Folkestone. Kent
Date June 1879.
Coll: J.C.M. ~~Comm~~ Per
Ex herb: J. Cosmo Melvill.

If it were only for these historic records, then *Pilosella peleteriana* might have been written off as probably extinct in the county; but there is a more recent claimed find, on 9 June 2001, by Bob Woodhall, Brian Laney and Dave Horton at Langdon Cliffs TR 335 421 (this may have been TR 3350 4205). No voucher specimen was taken, but the taxon was familiar to the finders. It was noted at the top edge of vegetation at the foot of the cliffs, but the foot in this case was apparently located along Cliff Road half-way up the cliffs overlooking Dover Harbour, which is an access way levelled off as part of railway construction at the end of the nineteenth century, so as to form what is now a grassy plateau about 80m above sea level, with chalk cliffs both above and below. The site is on chalk, with a southerly aspect. Subsequent search has not brought it to light.


Hieracium Pilosella L. var.

In chalk & Gault.
Undercliff. Folkestone. S. Kent.
September 1893. coll: J. Cosmo Melvill.


Hieracium peleterianum Merat
Determinavit 1957
P. D. Sell
C. West
Undercliff Folkestone
June 1879
J.C.Melvill collegit
Hieracium pilosella L.
Determinavit 1957
P. D. Sell
C. West

Given the frequency of *Pilosella officinale* on the Dover/Folkestone cliffs generally, the only identification issues are in separating *Pilosella peleteriana* from that very variable species. Both are plants which spread stoloniferously with single yellow flower heads arising from rosettes of hairy lanceolate leaves; but *P. peleteriana* is more robust, with larger flower heads (over 12mm across excluding ligules), and shorter and thicker stolons often ending in a rosette of large crowded leaves with a shaggy-haired appearance. These differences were tested over 2021 finds at the undercliff of Folkestone Warren, TR 26509 38462 and TR 26543 38444, where plants were appropriately shaggy, with capitula 35mm in diameter (beyond the normal range of *P. officinarum*) and some with what appeared to be short, thick stolons ending in rosettes. The position regarding the short stolons required for *P. peleteriana* was not straightforward to ascertain, as the erosion of any thin soil on the chalk where the plants were growing would have left rhizomes exposed as though they were stolons. Specimens were provided to Tim Rich, who concluded that there seemed to be two *P. officinarum* taxa present, but not *P. peleteriana*, which would have had a more clumped habit.

Plantago media L. (Hoary Plantain)

vc15 and 16

Rarity / scarcity status

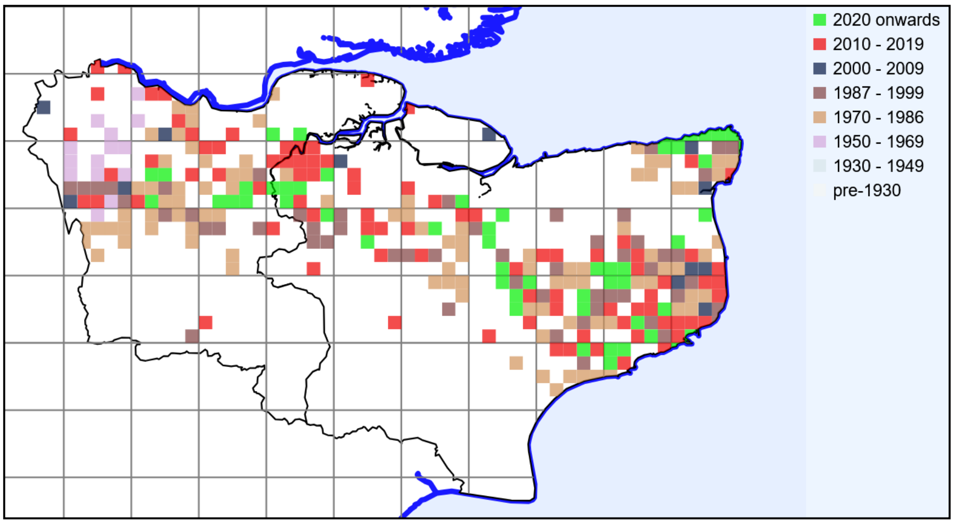
Hoary Plantain is a perennial of shortish grassland, generally basic, widespread in the south, except for the south west and the Weald, and no longer to be found in much of East Anglia. While it is generally not uncommon within its range and has a threat assessment of 'Least Concern' in Great Britain as a whole, a more recent assessment for England treats it as **Near Threatened** (just), on account of its area of occupancy having been taken to have declined by 22% in comparing records for the periods 1930-69 and 1987-99. In Kent, its frequency means that it is far from being treated as rare or scarce; but there has been an ostensible decline of 42% in its tetrad records between 1971 -1908 and 1991-2005, so this rate of decline is of concern. It is a Kent axiophyte and so is indicative of good habitat.

Wye Downs. Photo by Lliam Rooney, 4 June 2010

Account

Plantago media is first mentioned in Kent by Edward Jacob in his *Plantae Favershamienses* (1777) as '*By Road sides – common*' and it was sufficiently widespread and frequent that Hanbury & Marshall (1899) gave no other records, saying that it was a plant of dry pastures, etc., very common on the chalk and found in all botanical districts. The scope for the plant to be found off the chalk is indicated by Thomas Forster's *Flora Tonbrigensis* (1816), which covers an area generally of acid soils and at best neutral: he describes the species as 'On the Common at Tonbridge Wells; and elsewhere frequent'. It appears to be no longer there. As a common plant, it did not subsequently attract much botanical notice; but for the period 1971-80, Philp (1982) recorded the species in 222 tetrads, finding it to be frequent in suitable habitats in dry grassy areas, usually on the chalk. For 1991-2005, however, the county distribution is shown in Philp (2010) as much thinned out, reduced to 129 tetrads.

By way of comparison, our 2010-24 records amount to only 141 tetrads (181 monads) and as they include metropolitan West Kent records in nine tetrads, which Eric Philp's surveys did not cover, then these records endorse the picture of earlier decline, graphically shown by the accompanying tetrad distribution map, but without suggesting any further diminution.



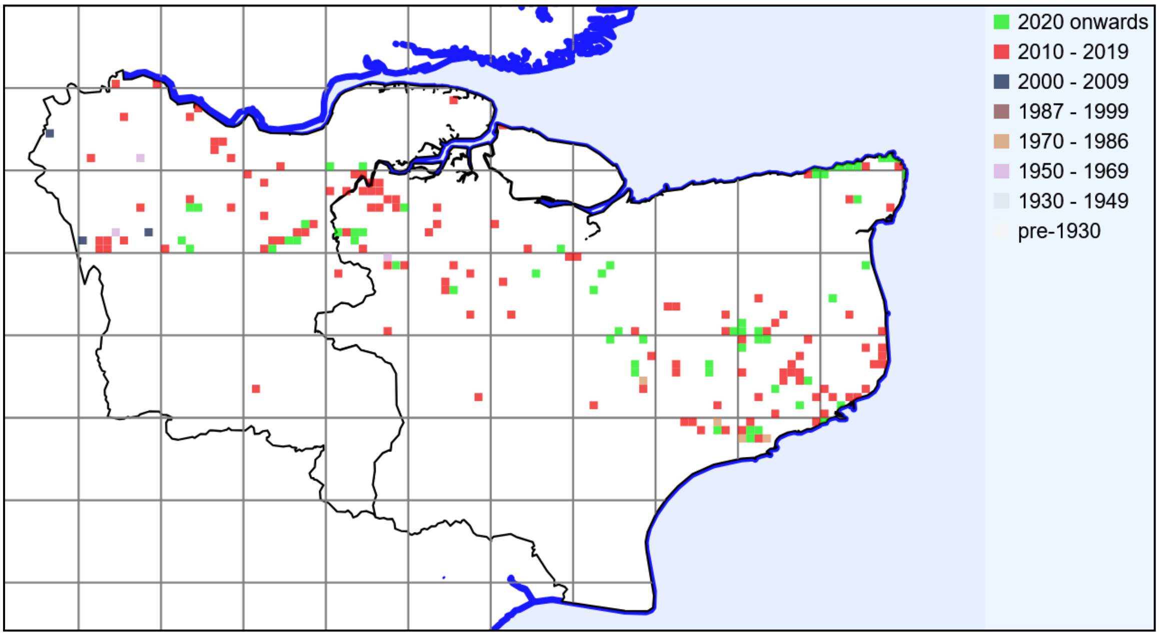
***Plantago media* Kent records to 2024 mapped at tetrad level, from BSBI database.**

It seems unlikely that permanent loss of calcareous grassland can have accounted for all this loss, although it may be relevant to part of the species' history of decline. *Plantago media* may well be one of those species which are adversely affected by the increased deposition of atmospheric nitrogen. Studies in Belgium[560] of a chalk grassland plant community of which *Plantago media* is a typical member showed a decrease in species richness with the application of nitrogen, even within a four-year period, where there was a lack of management. Grazing or, to a lesser degree, mowing reduced the effect. Nitrogen enrichment tends to favour tall growth of grasses and so reduce light at ground level, with potentially adverse results for rosette plants.

The Belgian study did not involve a grassland community including *Brachypodium rupestre* (Tor-grass). In East Kent, where this grass can readily become dominant on chalk downland in the absence of grazing or mowing, it is possible that *Plantago media* could be crowded out, without the additional factor of atmospheric nitrogen deposition. This, however, does not seem to be a factor by which one could demonstrate greater decline in the east: the BSBI historical tetrad data, if anything, show proportionately greater decline in West Kent, where *Brachypodium rupestre* is uncommon. Almost total loss appears to be demonstrated along the chalk downs scarp from Wrotham westwards to the county boundary, although it is not devoid of residual unimproved chalk grassland.

Strood, rosette. Photo by David Steere, 20 May 2016

***Plantago media* Kent records to 2024 mapped at monad level, from BSBI database.**



Mapping at monad resolution, displays current records more fully, given that tetrad recording was the norm in Kent during 1970-2009 and monad recording from 2010 onwards

Although the geological position can largely be inferred from the distribution map, many of our recent records expressly mention the habitat as being chalk grassland, sometimes on cliff tops. Churchyards are also a habitat, where the grass is kept fairly short. Records off the chalk are exceptional, but there are a couple on the Hythe Formation, which may supply some base influence. In a habitat where grass grows tall, the growth habit of *Plantago media* may change (var. *lanceolatiformis* and var. *longifolia*) so that, instead of forming a rosette appressed to the ground, the leaves may be erect, narrower and with a petiole more or less as long as the leaf blade. We do not have Kentish observations of this[561]. It will be appreciated that such a plant will resemble *Plantago lanceolata* (Ribwort Plantain). *Plantago media* is a perennial, probably long lived, spreading both by seed (occasionally, in small open areas of ground) and (more frequently) vegetatively: up to twelve daughter crowns may be produced per season, developing from axillary buds.

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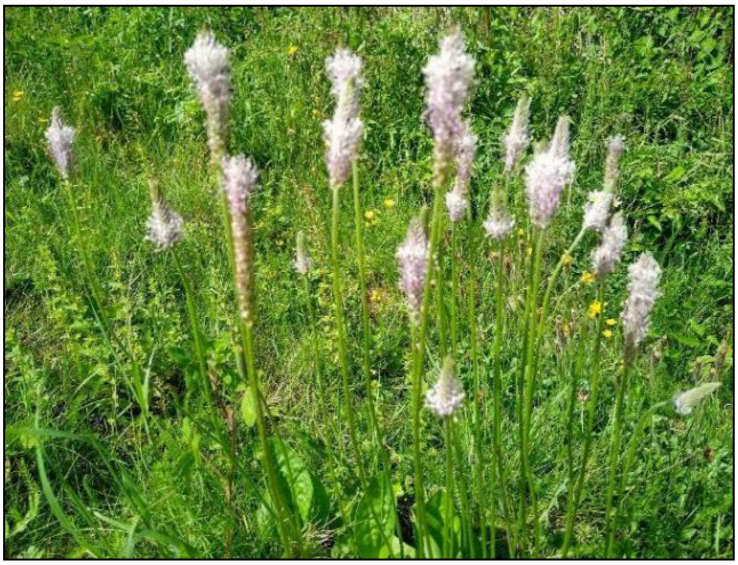
[560] Jacquemyn, H., Brys, R. & Hermy, M. (2003). Short-term effects of different management regimes on the response of calcareous grassland vegetation to increased nitrogen. *Biological Conservation* **111**: 137-147.



Eynsford. Photo by Sarah Kitchener, 5 July 2020

If plants are in flower, there are no identification issues involved in separating *Plantago media* from other British species of *Plantago*: the pinkish stamens on purple stalks are very distinctive. When in leaf only, then it needs to be borne in mind that *Plantago media* leaves can be drawn up to a narrow, erect form resembling *P. lanceolata*, as mentioned above. Normally, however, they are distinct in being ovate, rather than lanceolate. The leaves also differ from those of *Plantago major* (Greater Plantain) in being distinctly hairy, often with a petiole which is purplish at the base, and having opaque main veins (if viewed as held up to the light).

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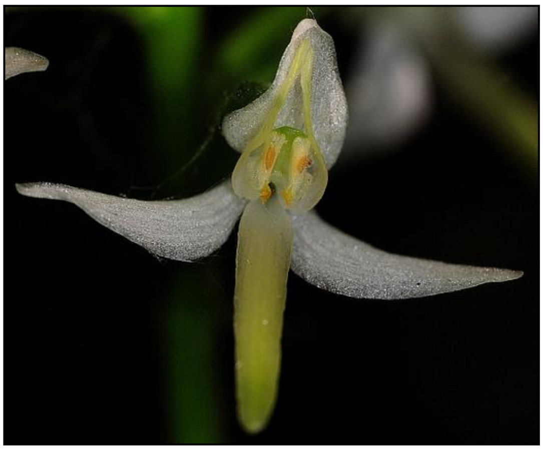
[561] This and following information taken from Sagar, G.R. & Harper, J.L. (1964). Biological Flora of the British Isles: Plantago major, L., P. media L. and P. lanceolata L. *Journal of Ecology* **52**: 189-221.

Platanthera bifolia (L.) Rich. (Lesser Butterfly-orchid)

vc15 and 16

Rarity / scarcity status

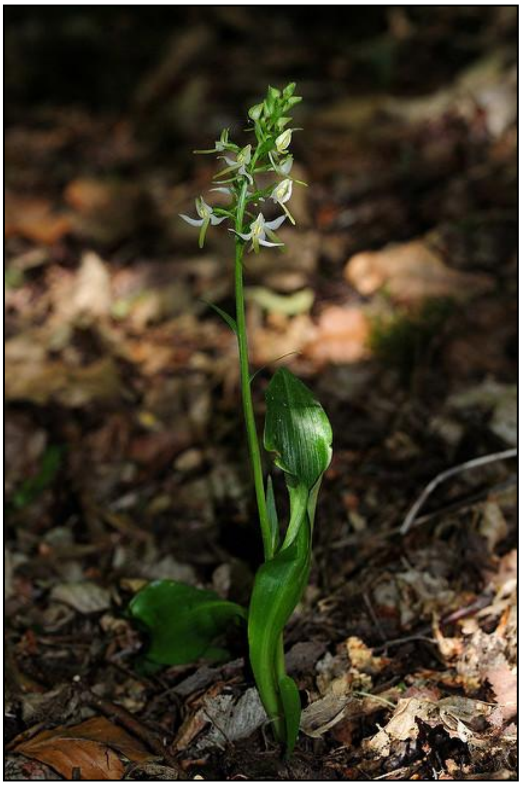
Platanthera bifolia is locally common in the British Isles, especially in the north, although largely absent from central England and East Anglia. Nevertheless, it has been in decline and is treated as **Vulnerable** to the risk of extinction in Great Britain as a whole and **Endangered** in England. This latter designation is on account of its area of occupancy in England being taken to have declined by 54%, and its extent of occurrence by 52%, in comparing records for the periods 1930-69 and 1987-99. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. The general decline is not replicated in Kent records since 1971. It is a plant verging on **scarce** in the county (rare in West Kent) and as a Kent axiophyte it is indicative of good habitat.



Covet Wood. Photo by Lliam Rooney, 17 May 2011

Account

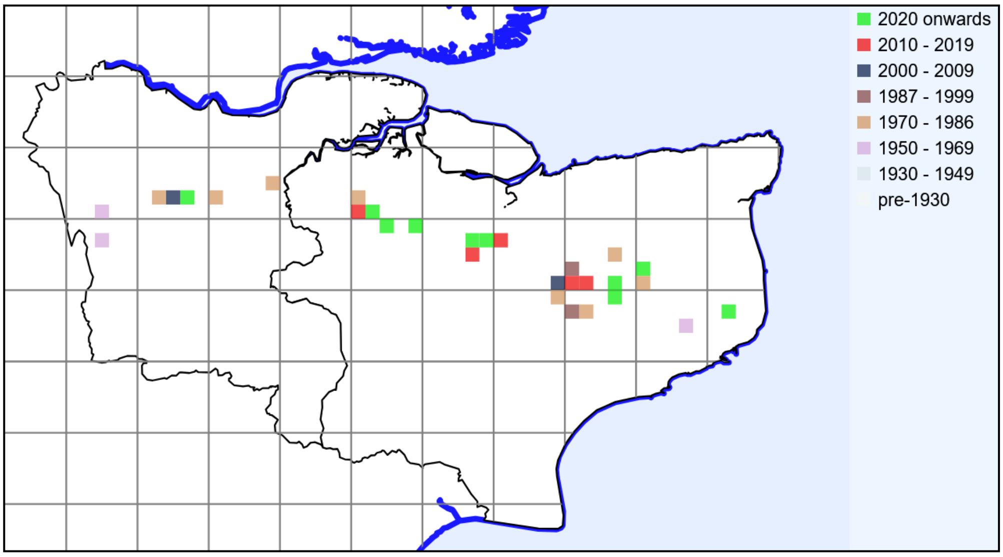
The first Kent record appears to be that of Edward Jacob who in his *Plantae Favershamienses* (1777) mentions it as '*In* Badgen *and* Cockset Woods – *not common*'. Unless an early record has been made by an author for both *Platanthera bifolia* and *Platanthera chlorantha* (Greater Butterfly-orchid), as did Jacob, it is not always possible to be confident that the two species have been distinguished. W.J. Hooker's *British Flora* (1838), a standard accessible Flora of its time which eventually developed into '*Bentham & Hooker*', lumped both species together. Later versions were still grudging about any distinction, even the 1924 edition giving an entry for *P. bifolia* (then *Habenaria bifolia*) only, but as having two 'forms', of which *Habenaria bifolia* was the 'proper' one. This was a view which influenced British recording during the currency of that Flora, although Darwin (*The various contrivances by which orchids are fertilised by insects*, 1877) disagreed strongly with *Bentham & Hooker* as regards failure to separate the species. Hanbury & Marshall (1899) accepted that there were two species and considered the Lesser Butterfly-orchid to be a plant of copses, etc., generally distributed, but not very plentiful. They were not confident that all the records which had they had collated were *Platanthera bifolia* to the exclusion of *Platanthera chlorantha*.



Covet Wood. Photo by Lliam Rooney, 17 May 2011

Francis Rose treated it as a plant of woodlands, mostly coppice, but also of beech, growing on chalk or on overlying loam (which presumably includes clay-with-flints), rarely on Gault Clay (e.g. Horish Wood, between Detling and Maidstone). He considered it (1940s to 1960s) to be very rare in West Kent, but fairly frequent in East Kent, on the chalk east of the Medway to the coast. He noted that it had been present at Keston Bog up to about 1930, but as an ovate-leaved form; our normal Kent form being with elliptical-lanceolate leaves. Philp (1982) gave it as very local and scarce, in hedgerows and open woodland on chalk, with ten tetrads recorded 1971-80. It seems likely, both from

Philp (2010) and from records made in the interim by Joyce Pitt, that the position was significantly understated in East Kent. Philp (2010) still has only ten tetrads, but eight of these are different. The scattered records are stated to be of small colonies or of single plants in open scrub and woodland on the chalk, but becoming less frequent.



***Platanthera bifolia* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Our 2010-24 records amount to 15 tetrads (17 monads) and include sites in neither Philp (1982) nor Philp (2010) as well as one which was in the former but not the latter. Hence the appearance of some losses in the accompanying tetrad distribution map, which are not borne out by the overall current county total. It could be maintained that the mapping alone does not provide evidence of an overall decline and, with records often being of a single plant or very few, perhaps it is being overlooked or does not appear every year.

However, David Johnson (*Wild Orchids of Kent*, 2019) saw a colony of 25 or so at West Kingsdown decline from the 1980s from scrubbing over, so that while records of occasional plants may continue in the general neighbourhood, the colony itself has gone. The decline of a woodland colony near Sittingbourne may be related to picking and digging up; but there are also general issues in Kent of rabbit grazing in relation to wood margin plants and deer grazing of plants within woodland. So a dot on a map does not necessarily indicate continued health of a population. Indeed, over 70% of our 2010-24 records which give plant numbers are for finds of five plants or less.

Stockbury Hill Wood. Photo by David Steere, 26 May 2015[562]

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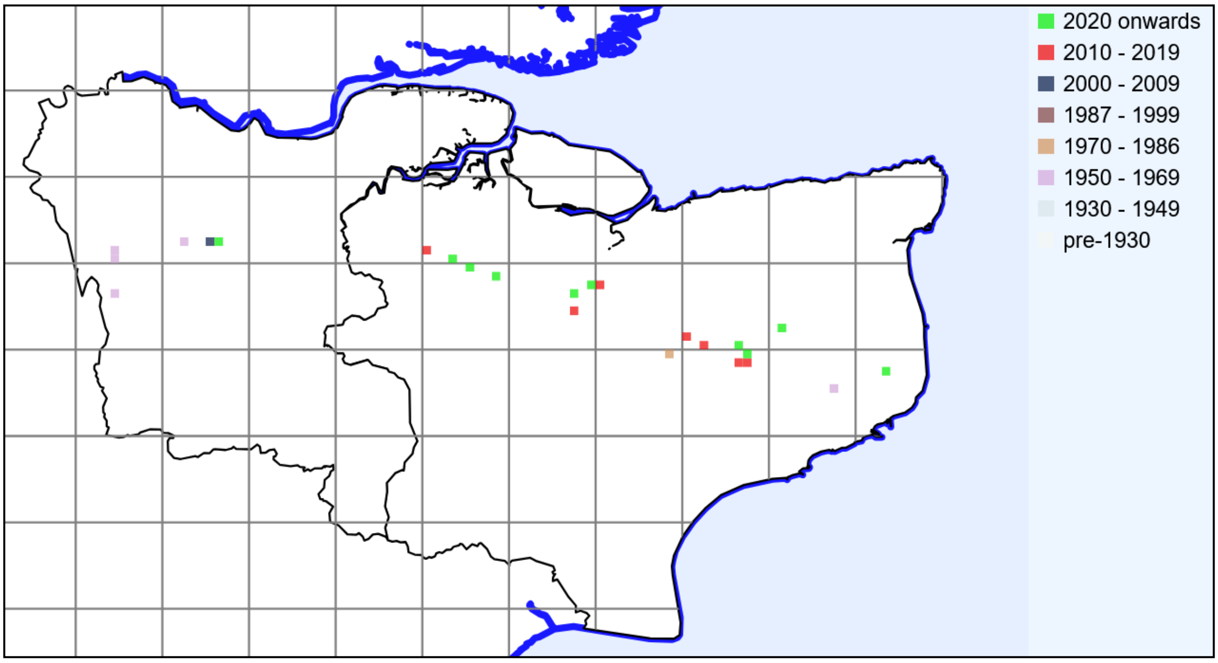
[562] The plant illustrated has not been seen at this location since 2015 and is believed to have been dug up.

While Francis Rose mentioned beechwood as a habitat, our recent records refer to ash/hazel woodland, ash/hornbeam, hazel coppice, hazel/hornbeam coppice, hornbeam coppice, and hazel/ash/sweet chestnut woodland. Often there is little understorey and *Platanthera bifolia* may be growing with other orchids, including *Platanthera chlorantha*. The coincidence of habitat, at least in Kent, (as well as general distribution) is a pointer to how little different the two species are.

They are primarily separated on the basis of the alignment of the two vertical pollinia: parallel in *P. bifolia;* diverging downwards in *P. chlorantha*. More generally, *P. bifolia* is not as tall; is smaller in its parts; and there are differences in the length and curvature of the spur.

Despite these differences, however, molecular analysis[563] showed no genetic distinction by which the species might be separated. Material used for molecular analysis included *P. bifolia* from a coppice north west of Sheldwich and from Stockbury Hill Wood; and *P. chlorantha* from Broad Downs (Wye), Park Gate Down and Yockletts Bank. These results suggest that the two taxa are in course of separation as species so that they have physical differences which are not yet reflected in genetic change which can be read through typical DNA barcoding, although they may be expressed in DNA sequences not normally sampled. *P. chlorantha* may well be a taxon which has evolved, or is still in the course of evolving, out of *P. bifolia.* For hybridisation with *P. chlorantha*, see the next species account.

***Platanthera bifolia* Kent records to 2024 mapped at monad level, from BSBI database.**



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[563] Bateman, R.M., James, K.E. & Rudall, P.J. (2012). Contrast in levels of morphological versus molecular divergence between closely related Eurasian species of *Platanthera* (Orchidaceae) suggests recent evolution with a strong allometric component. *New Journal of Botany* **2**: 110-148.

Platanthera chlorantha (Custer) Rchb. (Greater Butterfly-orchid)

vc15 and 16

Rarity / scarcity status

Greater Butterfly-orchid is widespread in the British Isles, more common than the related *Platanthera bifolia* (Lesser Butterfly-orchid), except in Scotland and Ireland. It is treated as **Near Threatened** in Great Britain as a whole (albeit its risk status being of 'Least Concern' in England), having suffered in the 20th century from felling, disturbance and coniferisation of woodland and the agricultural 'improvement' of pasture and scrubland. In Kent, it is neither rare nor scarce, and an ostensible decline since the 1970s does not seem to be borne out by recent evidence. It is a Kent axiophyte and so is indicative of good habitat.

Account

The species was first published for Kent (and, together with Hampstead Heath and Highgate, for the British Isles) by John Gerard in his *Herball* (1597), where he says 'That kinde [of Orchis] which resembleth the white Butter-flie, groweth…in the wood belonging to a worshipfull gentleman of Kent named master *Sidley* of South-fleete, where doe grow likewise many other rare and daintie Simples, that are not to be found elsewhere in a great circuit'. The reference to other rarities includes *Neottia nidus-avis* (Bird's-nest Orchid), which apparently was growing in the vicinity together with *Sanicula europaea* (Sanicle) in the middle of woodland near Howcke greene (Hook Green at Southfleet, not the Meopham or Wilmington ones).

Great Buckland. Photo by David Steere, 29 May 2016

As mentioned in the account of *Platanthera bifolia*, early records do not always clearly separate these species. G.E. Smith, in *A catalogue of rare or remarkable phaenogamous plants, collected in south Kent* (1829) gives an extended and lyrical description of its insect pollination coupled with an illustrated account of a monstrous form. However, he followed Sir James Smith's *English Flora* in calling it *Habeneria* [= Platanthera] *bifolia*, so as to cover both species. G.E. Smith's manuscript notes show that he was well aware that *Platanthera chlorantha* could be regarded as separate, but considered that careful and extended observation was needed to resolve the position, especially he had seen an occasional degree of variation in the diagnostic positioning of the pollinia which seemed to connect their distinctive appearance in both taxa.

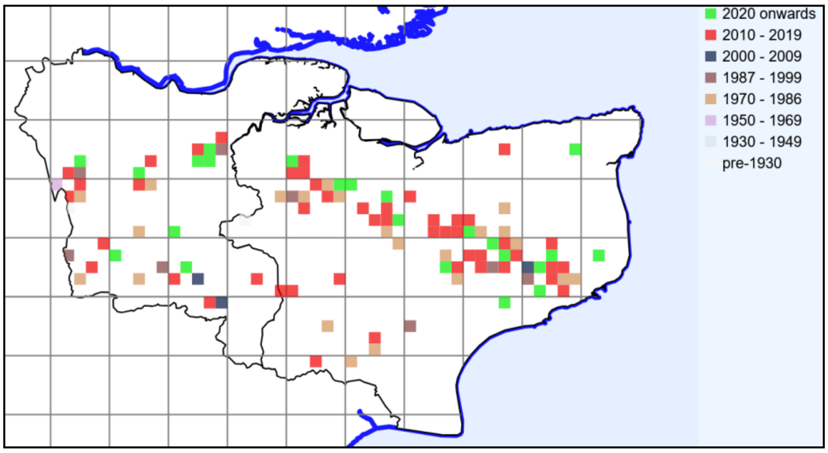
Although the academic botanists may have bracketed the species together under the influence of W.J. Hooker, perpetuated through the standard floras which developed into '*Bentham & Hooker*', the popularizing botanical writer Anne Pratt was comfortable in treating *Platanthera chlorantha* separately, recognizing it as taller and stouter, with larger flowers, and she drew upon her Kentish knowledge: 'we have observed it, in copses about Waldershare in Kent, attaining such luxuriance that its white flowers could be seen by moonlight, growing among ferns and bushes, as we passed the high road by the wood' (Waldershare was 7km or so from where she lived in Dover, 1848-66).

Hanbury & Marshall (1899) treated it as a separate species, frequent in woods, etc., especially on the chalk across the county. Because of this frequency, they scarcely bothered to give any records from the chalk, mentioning rather those which appeared to be growing on other substrates. These included Edward Jenner's record (in his *Flora of Tunbridge Wells*, 1845) of the orchid 'in the hedges about Bidborough, and in an old marlpit in the meadow left of the road from Southborough to Tunbridge'. The latter sighting (probably just north of Bidborough Corner) looks likely to have been on Wadhurst Clay, but with some base content if workable for marl. Jenner was another botanist who thought that Hooker was wrong, as the Greater Butterfly-orchid differed from the Lesser 'not only in the diverging anthers, but in the leaves and colour, and is much larger'.

Luddesdown, habitat. Photo by David Steere, 1 June 2015

Francis Rose noted *Platanthera chlorantha* as a plant of woodlands and scrub on chalk and on base-rich clays and loams – quite a wide habitat range – widespread and fairly frequent in the county, and locally in abundance. It was, at least in the 1940s-60s, unrecorded in the marsh districts of north Kent, the Lower Stour and Romney Marsh; and rare in the extreme north west Kent and the Weald. He listed over 110 sites, including a number in the Weald, and some Gault clay sites, such as Cadman's Wood, Brabourne; Westerham Wood; Cockney's Wood, Kemsing; and Ryarsh Wood. Although a tetrad record might cover more than one of these sites, the 1971-80 survey in Philp (1982), only accounted for 50 tetrad records ('Scattered… and locally frequent').

A disturbing trend appears, at first glance, to be indicated by Philp (2010), in which only 34 tetrads are given, a drop of 32%. However, this is not a trend confirmed by our 2010-24 records, which give a remarkable 70 tetrads (83 monads). The difference exhibited by the latest total – and, indeed, between Philp (1982) and Philp (2010) – may be because, as the latter states, the orchid is 'Usually in small numbers and easily over-looked' (and orchids in particular seem to be more fully recorded by a network of botanists, as took place in 1971-80 and 2010-23, rather than by a single recorder).



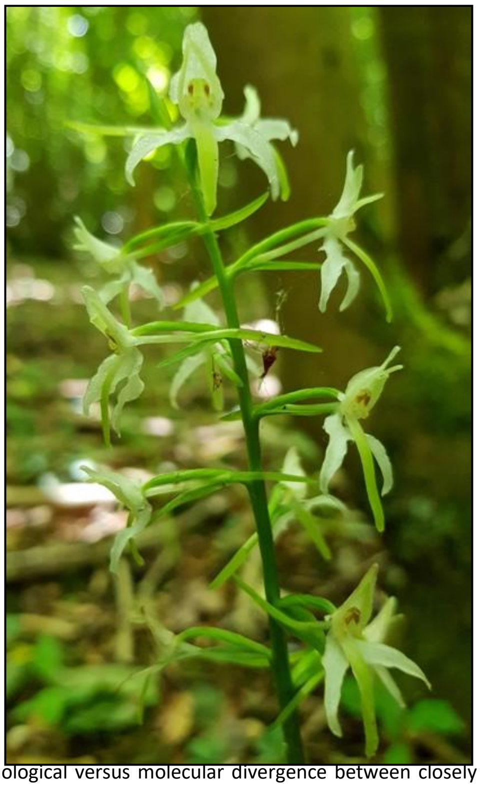
Platanthera chlorantha **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Something of the habitat range of the Greater Butterfly-orchid is indicated by our 2010-24 observations. Whilst it has been found in ancient woodland on chalk, there are records for secondary woodland and at Hever for a wood only planted some 20 years before, on what was, until planting, a farmed field. It has been noted under beech, yew, oak, hazel, hazel/ash coppice, ash/hornbeam/hazel/field maple; but has also been seen growing in scrubby chalk grassland, a meadow on chalk, a steep chalk grassland-slope and damp acid/neutral soils on Weald clay. In the more open habitats, the flowering spikes tend to be shorter and more compact (David Johnson, *Wild Orchids of Kent*, 2019). Singletons or small populations were seen less than in the case of *Platanthera bifolia* and some populations were sizeable: over 60 plants near Culverstone Green in 2010 of which more than half were in flower; 132 plants near Wootton in 2020; and at Bonsai Bank, Denge Wood, the number of flowering spikes has been estimated as in hundreds in some years. Its presence in the High Weald as well as along the chalk downs shows a greater ecological range than does *Platanthera bifolia*, which avoids straying from the downs.

Darwin's studies pointed to the specific differences between *Platanthera chlorantha* and *Platanthera bifolia* being related to differences in pollination. Both species offer a nectar reward as well as being (differently) scented, but the difference in alignment of the pollinia was found by Darwin to result in pollination of *P. chlorantha* being effected by attachment of pollinia to the eyes of moths, whereas *P. bifolia* pollinia attached to the proboscis. This has led to the assumption that speciation may be driven by differences in pollinators, evidenced by differences in spur length, which could accommodate different species of pollinator. However, there is a case that that spur length of both species is related to the geographical latitude of the plant measured, and does not provide substantial evidence of evolutionary selection pressure through pollinators[564]; but there are a number of studies which consider that such pressure exists.

Yockletts Bank. Photo by Lliam Rooney, 21 May 2009

For the differences between *Platanthera chlorantha* and *Platanthera bifolia,* see the register account of the latter. It has been suggested, however, that central European *Platanthera* falls into three, not two, gene pools and that plants with intermediate pollinia positioning (called *P. bifolia* subsp. *latifolia* or *P. fornicata*) can on the basis of both morphological and molecular study be treated as a third genetic entity, not necessarily of hybrid origin[565]. This, for Kent, then raises the issue as regards how far any such intermediates may be present here, and whether G.E. Smith's observations mentioned above (which will have been around 1830-33) relate to just such an intermediate entity. At present, however, one can only acknowledge that *P. bifolia* itself appears to cover a significant range of variation and through this may include some intermediates, but there are unresolved issues as regards attribution of specific status to other populations[566].



Platanthera bifolia x *chlorantha,* Martin Mill.
Photo by Sue Buckingham, 9 June 2020

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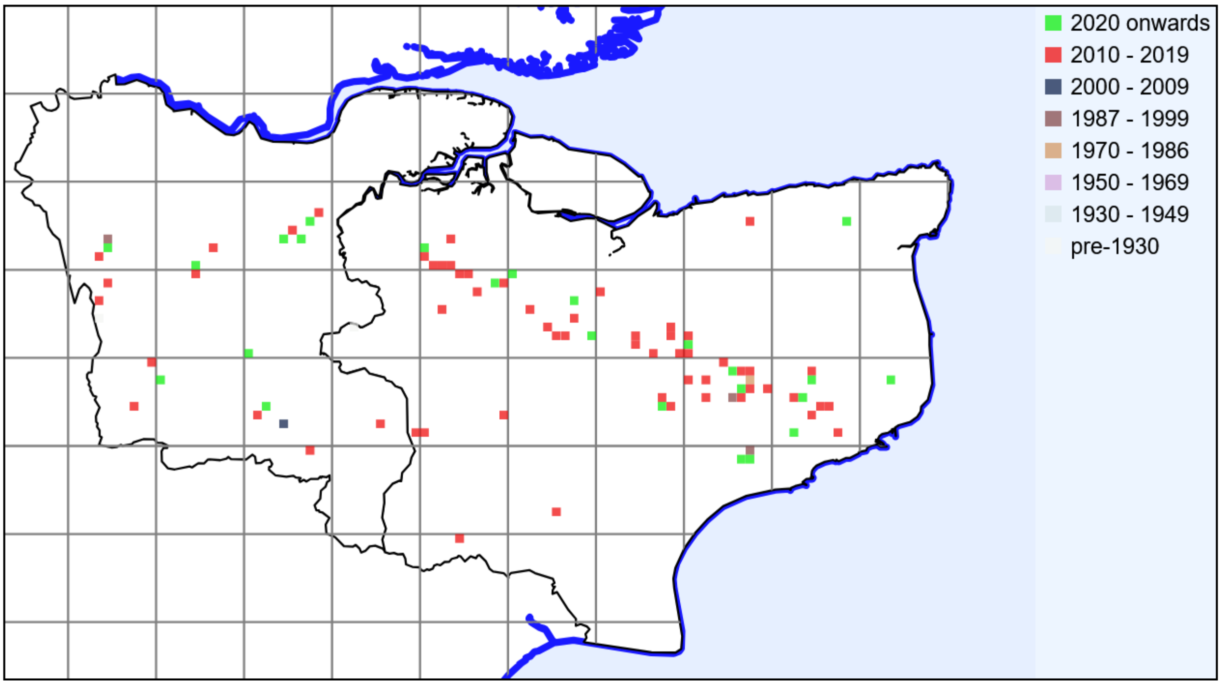
[564] Bateman, R.M., James, K.E. & Tudall, P.J. (2012). Contrast in levels of morphological versus molecular divergence between closely related Eurasian species of *Platanthera* (Orchidaceae) suggests recent evolution with a strong allometric component. *New Journal of Botany* **2**: 110-148.

[565] Durka, W., Baum, A., Michalski, S.G. & Baum, H. (2017). Darwin's legacy in *Platanthera*: are there more than two species in the *Platanthera bifolia/chlorantha* group? *Plant Systematics and Evolution* **303(3)**: 419-431.

[566] Tyteca, D. & Esposito, F. (2018). Recent proposals in *Platanthera* (Orchidaceae) systematics in Western Europe, with focus on intermediate looking plants. *J. Eur. Orch.* **50**: 393-408.

As regards hybrid intermediacy, we have two records of crossing. The first was a find in June 2020 in woodland near Martin Mill where there was a mixed population of *P. chlorantha* and *P. bifolia,* including at least one plant with the delicate general appearance of P. bifolia but possessing clearly divergent pollinia[567] and which, with a spur length of 24mm (which is at the meeting point of the two species' measurement ranges), suggested a hybrid with *P. chlorantha*. Hybrid identity was confirmed by Richard Bateman from photographs. The second was a plant at Gorham Wood, Bicknor, found in 2023 growing with *P. chlorantha*, but with *P. bifolia* having been seen previously in the general vicinity.

***Platanthera chlorantha* Kent records to 2024 mapped at monad level, from BSBI database.**



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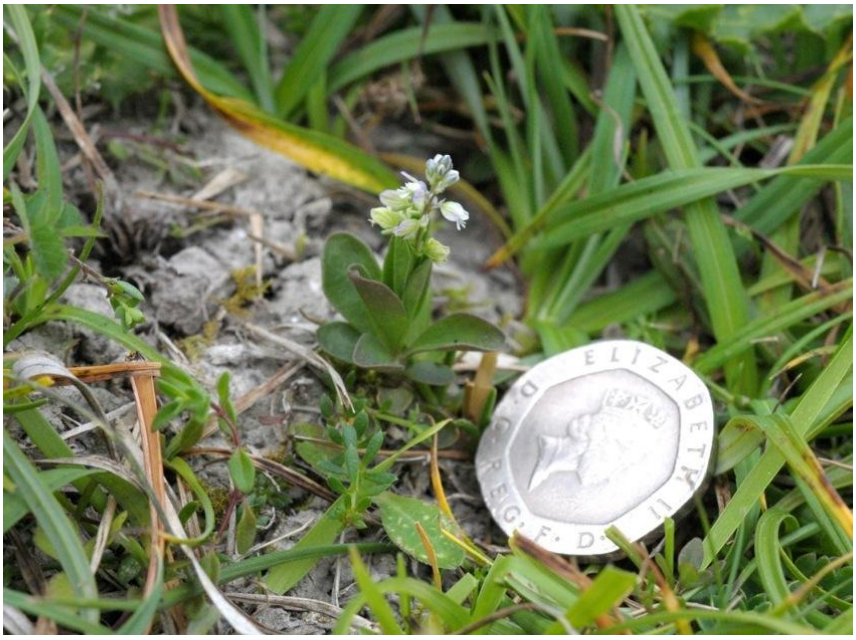
[567] An average angle of pollinia divergence of 26° is given for Skye specimens (cf. 5° maximum for *P. bifolia*, 45° for *P. chlorantha*) and 22° for Cranham Common plants in Swainbank, T. (2017). Is the hybrid between Britain's two butterfly orchids, *Platanthera* x *hybrida*, under-recorded? *BSBI News* **135:** 51-58.

Polygala amarella Crantz. (Dwarf or Kentish Milkwort)

vc15 and 16

Rarity / scarcity status

Polygala amarella is the name currently used to cover a **nationally rare** taxon with a very local and disjunct distribution in the British Isles, found in the Craven district of Yorkshire, limestone areas near Orton in Cumbria, the 'sugar limestone' of Upper Teesdale and the chalk downs of Kent. In the past, taxonomic treatment has varied, with the northern plants at one time called *Polygala amara* L. and the southern plants, *Polygala austriaca* Crantz; but after the publication of Fearn (1975)[568], it has been usual to treat all together, undifferentiated, under *P. amarella*. The conservation risk rating for *P. amarella*, in England and in Great Britain as a whole, is **Endangered**, which is supported by its area of occupancy having been taken to have declined by over 50% in comparing records for the periods 1930-69 and 1987-99. Also concerning is its limitation to 15 locations and a population of about 950 plants, but these factors alone would not drive so high a risk rating. If the northern and southern plants were to be treated as separate taxa, *P. amarella* subsp. *amarella* and *P. amarella* subsp. *austriaca*, then their respective threat assessments would have been Vulnerable (northern populations) and Critically Endangered (Kent populations)[569]. Accordingly, whilst the Kent plant is **rare** in any event, if there were to be a taxonomic re-assessment so as to give more distinct status to the Kentish Milkwort, it would be of national concern as Critically Endangered. Since 2020, it has been treated as an indicator species for the Kent Biodiversity Strategy, as a result of which it has been given increased survey attention. It is also the subject of reintroduction schemes by the Species Recovery Trust. As a Kent axiophyte, it is indicative of good habitat.



Godmersham. Photo by Alfred Gay, 26 June 2014

Account

The first published account of this milkwort in Kent was a note by J.F. Duthie in the *Journal of Botany*, referring to *Polygala austriaca* 'which I had the good fortune of discovering on June 5th [1871] on Wye Down. …On June 17th I again, in company with another botanist, found it plentifully growing in two narrow strips of rough, chalky ground on the border of copsewood. There must surely be more of it on other parts of the downs, which are very extensive.' It is a late date for the discovery of a native plant, but it is normally very inconspicuous. Duthie was fortunate to see unusually large plants, some between four and five inches high, according to Henry Trimen, one of the Journal editors. A subsequent site description by Duthie was of a rough bank at the edge of copse wood above Coombe Farm.

This discovery was followed by others, once botanists knew what to look for and, indeed, new sites continued to be found until 1988. It is at times difficult to know to what a historic site description relates and whether two ostensibly different descriptions may actually relate to the same site, but the accompanying map, prepared from the BSBI database (but correcting some of the data), gives the distribution on a tetrad basis. What is immediately striking is the extent of loss of sites from 1970-86 onwards, with only three current sites remaining. This high rate of attrition seems in part to be due to ploughing up, but mostly because of changes in habitat, with grass density increasing, scrubbing over and tree canopy forming, whereas the Kentish Milkwort requires open conditions.

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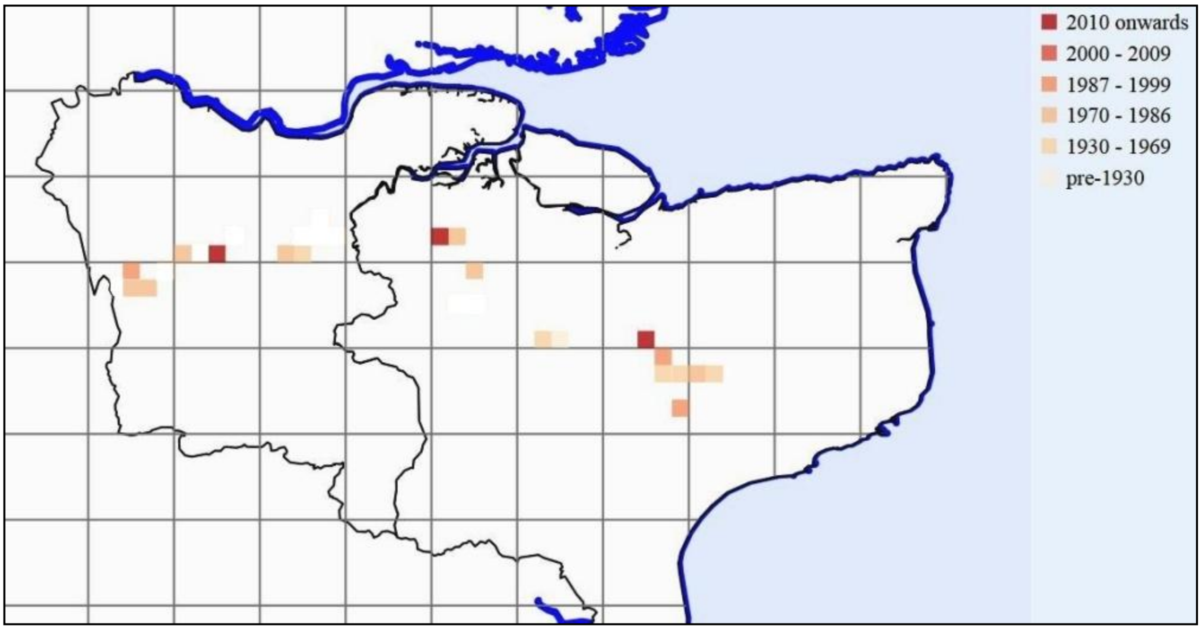
[568] Fearn, G.M. (1975). Variation of *Polygala amarella* Crantz in Britain. *Watsonia* **10**: 371-383.

[569] Stroh, P. et al. (2014). A Vascular Plant Red List for England. Botanical Society of Britain and Ireland, Bristol.

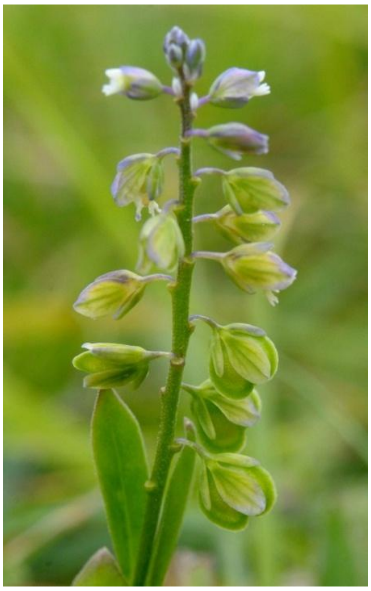


***Polygala amarella* Kent records to 2024 mapped at tetrad level, (adjusted) from BSBI database**

The sites follow the line of the North Downs, from near Hastingleigh in the east to near Westerham in the west, stopping at the county border although there is a long extinct site at Caterham in Surrey. They are of two types: records relating to the line of the downs escarpment and records in the downs hinterland. The latter are sites of chalk slopes on dry valleys, most of which run south-north down the downs dip slope, so that the aspect for the milkwort is either east or west facing. However, there are also sites, such as Queendown Warren or Purple Hill, where the valleys curve round to provide a more or less southerly aspect. All sites are well-drained and the norm is for fairly skeletal soils on slopes, with the milkwort generally growing in short, old, semi-open turf or fairly bare, disturbed chalk ground.

A further feature of the Kent sites is the number recorded as relating to old chalk workings and their immediate surrounds. This was the case at Westerham, Brasted, Polhill railway tunnel, Trottiscliffe, Purple Hill, Charing Hill and Bavinge Farm (in part). It is highly improbable that this points to the plant being introduced with mining activity; but rather that the opening up of the bare chalk creates an open habitat without even the limited soil cover which would support competitive vegetation. This absence or restriction of competition appears to be favourable to the milkwort. Unfortunately, chalk workings are in general not highly regarded by conservationists, and farmers are likely to fence them off from grazing. Ultimately, even with slowed succession because of the absence of soil, such habitats may well become tree-dominated and unsuitable for the milkwort, albeit that the milkwort appears to favour pit surrounds rather than pit faces. Tree cover has taken over at Westerham, Brasted, a secondary Magpie Bottom site, Trottiscliffe and Bavinge Farm (in part). This may of course take place on downland as well, particularly if grazing is discontinued; but chalk workings would appear to be at greater risk.

The extent of decline of Kentish Milkwort and the limited amount which we know about it, in comparison with the northern form, *P. amarella* subsp. *amarella,* warrants some more detailed consideration of the historic colonies. Surveys of ten historic sites by Alfred Gay in 2013-2014 found that some suitable habitat survives at five of these, although not necessarily at the precise locations where the plant formerly occurred. In the following section, information is given as regards historic sites generally, and these are ordered from west to east, except for the Wye area where the colonies will be dealt with in clusters. After that, the three extant colonies of Magpie Bottom, Purple Hill and Godmersham Downs are considered.



Godmersham, with developing seed capsules.
Photo by Alfred Gay, 28 June 2014

Historic sites

Blackbush Shaw or Berry's Green Wood (1946-1993)

Kentish Milkwort was discovered here (TQ 442 591[or 3]) by R.G. Spooner in 1962, when also seen by Francis Rose and noted as locally abundant. It was on the east-facing side of a dry chalk valley now in the London Borough of Bromley. Aerial photographs show some scrub and tree development in 1960, which had become apparently dense secondary woodland by 1990. The milkwort was within a small clearing, where encouragement was given c.1980 by scraping off a bare patch, so that, when viewed by Joyce Pitt in July 1985, there were some 31 plants present. Further work was undertaken, clearing the scrub re-growth and raking grass, with the result that 218 plants were counted by Joyce Pitt, Francis Rose and Rosemary Fitzgerald in May 1986, concentrated in a scarified patch but also scattered elsewhere; there may have been up to 300 plants in all. In 1989, 50 plants were seen and a further scrape made that autumn. Joyce Pitt counted 10 plants in 1993, but could not find any in 1995, so the milkwort seems to have gone by then. When the site was sought by Fred Rumsey in 2009[570], the glade was thought to be more or less lost to nitrophilous species such as *Urtica dioica* (Common Nettle) and *Galium aparine* (Cleavers); but it is possible that this was not the precise site or sites (Joyce Pitt recollects three locations and with Holly Stanworth has placed former occurrence at TQ 44199 59206) – it since retains an appearance of chalk grassland, with several orchid species, but only *Polygala vulgaris* (Common Milkwort), rather than the rare species.

Blackbush Shaw, survey by James Teacher, Jo Weightman, Joyce Pitt and Francis Rose.
Photo by Rosemary FitzGerald, May 1986

Pilgrim House, near Westerham (1971-72)

Records from this site (TQ 448 565) come from Ray Clarke, who found the milkwort in 1971 on the Downs escarpment above Pilgrim House, north of Pilgrim's Way (not to be confused with Pilgrim House, Trottiscliffe, mentioned later). The habitat was an old chalk working site, with ten plants or more not only on the site platform (as at the Nower), but on steepish slopes below. The 1909 ordnance survey map shows what could be chalk workings at TQ 4496 5652, but there is tree cover at present. The milkwort apparently did well again in 1972, but could not be re-found by Rosemary FitzGerald in 1986; nor by Joyce Pitt in 1986 and 1981 (who found the area very scrubbed up and the lower part of the grassland ploughed); nor could it be found in 2009 by Fred Rumsey, who found the turf 'improved' here.

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[570] For information here and in many other respects, this account is indebted to Fred Rumsey and his paper: Rumsey, F.J. (2009). A survey of Kentish Milkwort (*Polygala amarella* Crantz subsp. *austriaca* (Crantz) Dostál) with recommendations for management. Unpublished report.

The Nower, Brasted (1957-1972)

A find was made by Ray Clarke in autumn 1957 in chalk turf on the downs at the Nower, Brasted (TQ 460 571). The Kent Field Club visited the site on 31 May 1958 under the leadership of Francis Rose, and saw the species in abundance on the downs[571] – there were over 100 plants. J.E. Lousley described the location as one on 'steps' in a steep chalk slope associated with old chalk workings (1958), which are indeed present, but now long covered with trees. Aerial photographs from 1960 show more open ground at the foot of the scarp above arable fields than exists now, but in 2015 there was also land opened up which was under tree cover in 1960 and there is an area of chalk grassland slope with some broken ground which seems suitable, within the scope of the original grid-reference. However, Ray Clarke apparently considered it gone by 1972 and a search here in 2020 was unsuccessful.

Polhill railway tunnel (1972-1986)

Kentish Milkwort was recorded by Ray Clarke on the bare chalk edge above the railway tunnel in July 1972, only one specimen being visible at this late date. Joyce Pitt also saw it (c. TQ 506 603) in 1985 and the last sighting, in very small quantity, was in 1986. This was the year of opening the Swanley-Sevenoaks section of the M25, constructed on steep embankment by the tunnel portal. This will have affected aspect and probably other features of the habitat. Aerial photographs show considerable bare chalk ground above the tunnel, a reduction with scrubbing over being evident from 1990 aerial photographs. Whilst periodic scrub reduction takes place on the cuttings, as with railway property generally, there is no evidence of continuance of the plant, although the site of course presents safety and access issues.

Polhill tunnel portal. Photo from Rosemary FitzGerald, c.1986

Trottiscliffe (1950-1960 [1971])

The milkwort was found by D.P. Young in 1950 at an old chalk pit near Trottiscliffe and there are subsequent records in the 1950s, assigned varying grid references in the BSBI database. In view of the ambiguities, it is allocated two tetrad squares in the accompanying distribution map. However, if these are all the same site, then a record by Francis Rose with Joyce Pitt for 1960 to which TQ 634 608 is allocated seems the most persuasive identification – a chalk pit off Taylors Lane on the downs escarpment which was open ground in 1960 but since tree-covered. This would correspond to a description in Francis Rose's unpublished Flora, 'about 20 plants, on side of ancient chalk pit w. of Pilgrim House, Trosley' (although he gave TQ 635 608). The most recent record does not seem to be quite the same location – this was made by Ray and Phyll White in June 1971, two spikes on an ungrazed tussock in a severely grazed field at the Trosley scarp.

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[571] Rose, F. (1960). Botanical Records for Kent, 1955-58 – vascular plants. *Transactions of the Kent Field Club* **1**: 56-65.

Also, Reports of field meetings [1958]. *The Bulletin of the Kent Field Club* (1959) **4**: 10.

Queendown Warren (1898-1979)

Dr Druce gathered material at Queendown Warren in 1898 (**BM**). A collection of very vigorous plants was also made here by Cecil Hurst on 24 May 1901 (**SLBI**). It is given a record in Philp (1982), whose survey period includes 1979, when seen by Francis Rose with the Kent Field Club at TQ 830 629. This long gap raises questions as to how the milkwort continued, whether through prolonged seed dormancy, evidence for which is otherwise in short supply, or whether through being overlooked due to its inconspicuousness. The historic site is distinct from the reintroduction site (see below), which is on lower ground.

Godmersham.
Photo by Lliam Rooney, 13 June 2012

South Green (1952-1955)

There are records for Rumsted Court or south west of South Green by Francis Rose from 1952, to which a grid reference of TQ 847 599 has been assigned (and is noted in Francis Rose's MS Flora), maybe on the basis of J.E. Lousley's 1953 description of 'Hillside ¼ mile west of South Green, Stockbury'. However, this location was, from aerial photographs for the 1940s onwards, in cultivation; and more likely territory was rising chalk pasture 600-700 yards south west of South Green, around TQ 844 597 to TQ 845 598. A 1955 record by P.C. Hall for 'Rough chalk down near Rumsted court' would have suited this (better than the grid reference of TR 847 598 assigned in the BSBI database, which in any event is a location which has since been under plough). This is a downs hinterland site, of more or less eastern aspect. It was searched in June 2017 (Geoffrey Kitchener and Lliam Rooney) without success (and again by the former in 2023): a limited chalk grassland flora remains, and there is broken ground from cattle trampling and rabbit activity, so occurrence is not out of the question, especially as a find of *Arabis hirsuta* (Hairy Rock-cress) was made there the same year (TQ 845 598).

Cobham Farm, Lenham (1906-1950)

Kentish Milkwort was first found here on 22 May 1906 by Hubert Elgar, a curator at Maidstone Museum, on 'chalk hills between Lenham and Charing', so this would be a downs escarpment site. The *Woolwich Surveys* (1909) place the site between Lenham and Maidstone, but this is not in accord with the herbarium specimen label (**SLBI**). Elsewhere, Elgar's find is noted as at Pilgrims Road, east of Lenham, Cobham Farm (this would be TQ9351, as also appears from 1945 and 1946 records by Francis Rose, 'Downs NE of Cobham Farm'). More precision is given in relation to material collected by D.P. Young in 1950 from Foxbury Wood (this is at TQ 936 514). It is noted against the 1946 specimen at **MNE** (and in Francis Rose's MS *Flora of Kent*) that the site was ploughed in 1958.

Charing Hill (1890)

A specimen at **BM** collected in 1890 by John Leitch from Quarry, Charing, will have been further east (TR9550). The most likely site is a chalk quarry on the escarpment north of the North Downs Way (TQ 9537 5028), but the 1897 ordnance survey map shows the quarry to have been much more extensive to the east of what can currently be accessed.

Wye to Crundale

(a) **Longport Down/Warren Wood, Crundale (1890-1997)**

Although it is not clear how this might fit into the account in Hanbury & Marshall (1899), Marshall seems to have found the milkwort in 1890, between Wye and Crundale (**BM** specimen). This may relate to Longport Down/Warren Wood, which lies directly between. Warren Wood in effect is a continuation of the Wye Downs chalk escarpment facing westward to the Great Stour valley, although it is on a ridge with a valley to the east as well. The west facing slope alongside Longport Road, from aerial photographs, shows a progression from scrubby grassland in 1940 through to full tree cover by 1990, although there has been some opening out of the main wood after 2011. Francis Rose had a 1951 record for 'Down at Longport near Crundale' and returned there for a 1964 record, given as TR 076 485. G.M. Fearn found about 50 plants in total, spread in two locations, TR 074 487, one on each side of Warren Wood but at the same latitude (which may imply east and west aspects, the wood being on a ridge). A site on east-facing downland (and so maybe east of Warren Wood) is mentioned in Francis Rose's MS *Flora*, west of Crundale, where the milkwort was abundant with over 150 plants seen in several years during the period 1950-64, a few of them being white-flowered. When Rosemary FitzGerald visited in May 1987, plants were found around narrow steps up west-facing Longport banks, TR 074 488, about five to seven metres above Longport Road. There was a sighting was two years later, by B. Pardon (there are also claimed but unattributed 1989 records for Black Edge Wood, which is on lower ground to the west). The final record appears to be that of Francis and Pauline Rose with John Ockenden, two plants west of Longport Road, TR074 488, in June 1997.

(b) **Pett Street Down (1901-1960)**

John Percival found Kentish Milkwort in 1901 on the Wye Downs near (south of) Marriage Farm, which may well coincide with where, in 1946, Francis Rose found a few plants growing on 'Downs west of Pett Street' (Pett Street Down, c. TR 081 474, which is east-facing downland on a ridge between dry valleys). His is also the last record, in 1960.

Wye

It appears that the plant was in several stations at or in the vicinity of the Wye Downs; it is not always possible to identify to which a record may belong. Frederick Hanbury (in Hanbury & Marshall, 1899) describes it as 'Near Amage Farm; about Bavin's Farm, 3½ miles E. of Wye; and on some rough ground near the base of the downs about 3 miles from Wye, towards Hastingleigh', i.e. three sites.

(a) **Wye Downs, Amage Farm (1871-1951)**

The first of these sites, the Amage Farm location, is from that description likely to have been in TR0745 or TR0746. It may also be the same as the first (1871) Kent find site, and when Dr Druce collected from Wye Downs in 1898 ('from the chalk downs above Brook') he was not sure, stating in a letter at **BM**: 'Conceivably the same spot as the old record. In one spot quite plentiful. *Orchis purpurea*, *ustulata*, *aranifer*a turned up plentifully, too.' Collections from 'near Wye' were made by both Hanbury (1883) and Marshall (1888, 'grassy banks of copses near Wye, in 3 or 4 stations, abundant in one of these'; this may have been a sweep round all sites, not necessarily restricted to Wye Downs. R.A. Graham found it in 1951, the location being assigned as TR 073 466, which would be east of Wye Crown, north of Amage Farm.

(b) **Bavinge (main site 1875-1948; Podlinge 1948; Little Gains 1954-1958)**

The second site, Bavin's Farm, Bavan's or Bavinge, is at TR1046, this colony being one of the North Downs dip slope hinterland sites, as distinct from an escarpment site, to which the other sites (a) and (c) presumably belong. The Bavinge occurrences were apparently in several stations, scattered over about a mile (according to Hanbury and Marshall). Hanbury visited with Duthie on 10 June 1875 and, after viewing the original Wye Downs locality, 'we came across it in still greater abundance on chalk banks in a little valley known as Bavin's Farm, which is about three miles east of the original locality. On one bank especially the plants were very fine and abundant, and mixed with other rarities, including *Orchis fusca* and *Herminium monorchis*' (*Journal of Botany*, 1875, **13**: 237). J.E. Lousley collected a sheet full of material from what was present 'In small quantity, amid coarse grass in small chalk pit near Bavin's Farm', and repeated this in1937. Apparently this is not the pit in Doves Wood west of Bavinge Farm, since Francis Rose in 1945 found it in a 'Chalkpit north of Bavinge Farm', and H.W. Pugsley annotated his own copy of the Flora of Kent that the plant was round the side of a chalkpit north west of Bavinge Farm. Such a pit is shown in open ground on the 1898 ordnance survey between Woolfinch and Bavinge Woods, c. TR 104 469 (this is the grid reference given in Francis Rose's MS *Flora*). It was visited by Rosemary FitzGerald in 1986; the site was thought to be no longer suitable and currently appears to be tree-covered. The chalk pit (from which the last record traced is 1948), however, was only one of the Bavinge cluster of stations. Another station is likely to be 'Chalk Down near **Podlinge** Farm' (Francis Rose, 1948, taken in the BSBI database to be TR 111 469, although TR 112 471 is given in his MS *Flora*. Gill Fearn apparently noted (1978) that the site had been ploughed up. When Francis Rose and Rosemary Fitzgerald visited in 1986 they found the whole of this fine valley had been converted to arable or re-seeded, even though the down where the species had been was so steep that the modern grasses could not thrive. There is also a record by Len Margetts (Francis Rose's MS *Flora*) for Whiteacre Farm, Waltham (at the north end of a valley which branches south east to the Podlinge site). Further south west is **Little Gains**, a locality taken from Francis Rose's unpublished *Flora* and attributed to Ray Clarke (1954), also recorded by Francis Rose (1958): this place name is applied to a valley north east of Spong Wood, c. TR 127 461.

(c) **Wye Downs towards Hastingleigh: Fishponds (before 1899)**

This site, given by Hanbury & Marshall (1899) as at the base of the downs about 3 miles from Wye, looks likely to lie south east of Wye Downs and their continuation, Broad Downs. C.E. Salmon and John Percival collected from Wye Downs in 1900, 'Rough ground on Downs SE of Cocklescombe' – this must be a version of Cuckoldscombe, now Fishponds Farm, TR0844. Paul Stanley's 1987 record at TR 084 437 is at the base of the downs and south east of Fishponds, and is almost exactly three miles by road from Wye church, so it would fit well the historic descriptions. He did not re-find it in 1996, although plenty of *Polygala calcarea* (Chalk Milkwort) was present.

Extant sites

Magpie Bottom, Shoreham (1897 to date)

In the *Journal of Botany* (1897) is a note by G.L. Bruce that 'On June 19th the Toynbee Natural History Society found *Polygala austriaca* in a new station, on the downs N.E. of Otford, Kent'. This clearly sparked immediate interest: Dr Druce came the next day and found it abundant, noting that it was clearly the same as the Wye Downs plant. Hanbury & Marshall (1899) identified the location as Magpie Bottom, where it was plentiful in 1898, but very scarce and local when found by A.J. Wilmott in 1911. There are subsequent records at intervals with varying quantities of plants seen, e.g. about 50 (Francis Rose, 1956), eight (G.M. Fearn, 1968, in very sparse turf, particularly in bare patches), four (Rosemary FitzGerald and Francis Rose, 1986), 46/30/61 (Fred Rumsey, 2009/2012/2013).

Magpie Bottom, habitat. Photo by Fred Rumsey, June 2009

Magpie Bottom is a dry chalk valley in the downs hinterland running south-north. The currently known site is north of the road with a western aspect on rising chalk grassland. It has been described as in 2013 notionally lying within a quadrilateral between TQ 54395 61201; TQ 54407 61211; TQ 54410 61202 and TQ 54410 61202.

Magpie Bottom, habitat, with Francis Rose, plants marked by red flags. Photo by Rosemary FitzGerald, 1986

Most of it is just above a small bare scrape and is related to a slight change in level which is detectable on aerial photographs as following the contour of the valley slope. Fred Rumsey remarks that this area is different in character from the rest of the site in that the turf is of finer grasses lacking the coarser species such as *Bromopsis erecta,* and that the turf is much lower with more rosette-leaved herbs – *Pilosella officinale, Cirsium acaule*, etc. with some small patches of bare ground between them. He suggests that it might have been chalk spoil dumped there from workings long, long ago, whereas the rest of the site has the original downland turf. It is also possible that it is a degraded lynchet from ploughing to a vanished field boundary, although that would probably have been represented more by soil than chalk; or it may be the site of a grubbed-up hedge, which would have displaced chalk to the surface to yield the present feature. No internal field boundary, however, is shown here on the 1840 tithe map. This feature suggests that there may be something in common with other historic sites related to old chalk workings.

Joyce Pitt in 2014 recorded the associated flora as including *Anacamptis pyramidalis* (Pyramidal Orchid), *Avenula pratensis* (Meadow Oat-grass), *Avenula pubescens* (Downy Oat-grass), *Briza media* (Quaking-grass) locally dominant, *Carex flacca* (Glaucous Sedge), *Euphrasia pseudokerneri* (Chalk Eyebright), *Helianthemum nummularium* (Common Rock-rose), *Hippocrepis comosa* (Horseshoe Vetch), *Polygala vulgaris* (Common Milkwort), and *Succisa pratensis* (Devil's-bit Scabious) along the top edge. *Gentianella anglica* (Early Gentian) has also been recorded in very close proximity. The milkwort does not appear, or at any rate is not found, every year: while over 100 plants were noted in 2015, it was not seen in 2019 and 2020 (the latter year had a very dry spring and the location was scrubbing up despite having been cut back two years before; rabbit activity also appeared to have diminished). Two were seen in 2021, three or four in 2022 (Geoffrey Kitchener and Joyce Pitt), four in 2023 (Geoffrey Kitchener and Holly Stanworth) two in 2024 when the sward was very rank (Holly Stanworth).

There have in previous years been two other stations at Magpie Bottom, known to Francis Rose and Joyce Pitt, and one of which appears to have been seen by G.M. Fearn in May 1968, as she recorded a grid reference, TQ 547 609, south of the road on a west facing chalk hillside. This was also related to an old chalk workings feature, which has acquired tree cover within memory; the margins remain a good potential habitat (2024). The other station, originally found by Joyce Pitt, lay north of the road on a similar slope (TQ 5464 6100).

Purple Hill, Bredhurst (before 1899 to date)[572]

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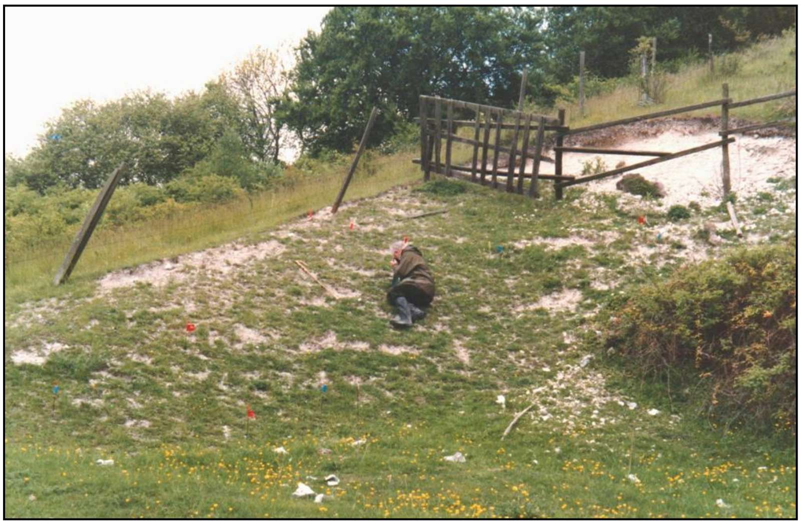
[572] For information in relation to this site, Godmersham and other matters relating to the Kentish Milkwort, this account is indebted to Alfred Gay and his report: Gay, Alfred (2015). Dwarf milkwort (*Polygala amarella*) Results from first two years of project (2013-2014). The Species Recovery Trust report.

Hanbury & Marshall (1899) mention a communication by George Bruce of the Toynbee Natural History Society (this must have been made quite close to *Flora* publication, as it is given under 'additions' in the 1899 *Flora*) that the society had found the milkwort plentiful over a small area about a mile west of Queendown Warren. It is likely that this was the current Purple Hill site. Some backing to this is given by an annotation 'On Purple Hill Nr Bredhurst 1904' in a copy of Hanbury & Marshall (1899) in the possession of Lliam Rooney (original owner unknown). It was seen by Francis Rose in 1959, when there were over 50 plants at TQ 813 621; and by G.M. Fearn in 1968, by whom TQ 814 622 is given as the grid reference, although somewhat to the north east of where it is currently known. However, Rosemary FitzGerald's record with Francis Rose at TQ 813 621 in May 1986 (approximately 90 plants on the edge of a disused chalk pit just north of Magpie Farm) corresponds very closely to the present location.



Purple Hill, habitat, with Francis Rose. Photo by Rosemary FitzGerald, 28 May 1986

More recent sightings include 18 plants seen by Fred Rumsey in June 2010 (14 at TQ 8129 6209, two at TQ 8128 6212, one at TQ 8217 6213 and one at 8129 6213; two plants seen by Geoffrey Kitchener in June 2011 (on the eroded short turf of the downs slope between a path and an old chalk pit, TQ 8129 6209); and 17 by Fred Rumsey in 2012; but only one plant seen by Alfred Gay in June 2013 (near the bottom of the slope close to the path, TQ 81288 62097), although numbers had recovered to one plant in bud and six rosettes in June 2014 (TQ 81288 62097). It was assumed that the dip in plant numbers for 2013 was due to heavier grazing than usual. Four plants were present in an area 50 x 50cm in June 2015 (Fred Rumsey). It was still present in 2020 but not found in 2021, nor in 2024 despite exposing some bare chalk along the chalk pit margin the previous winter.

Purple Hill, habitat. Photo by Geoffrey Kitchener, 23 June 2011

Purple Hill is a downs hinterland site, a steep chalk valley slope facing southwards. There are other notable species in the grassland flora, such as *Cuscuta epithymum* (Dodder) and *Galium pumilum* (Slender Bedstraw). The milkwort is associated with small steps or terraces of eroded ground, presumably kept open partly by the steepness of the slope but mainly by the passage of grazing stock, avoiding the proximity of an old chalk pit. So this is another case of a chalk workings related site and, again, it is the surrounds on which the milkwort is found, rather than the pit itself. The slope has been scrubbing over from what was relatively clear ground in 1940 aerial photographs, building up consistently in the pit since then, less so on the hillside, but following a clearance to the west of the pit between at some time between 1990 and 2003, hillside invasion also gathered pace. *Cotoneaster horizontalis* (Wall Cotoneaster) and *Crataegus monogyna* (Hawthorn) were recently the principal invaders and some clearance was carried out in February 2014, albeit that with re-growth, this would need to be a repeated exercise.

Godmersham (1988 to date)

Kentish Milkwort was first recorded here in May 1988 by Stuart Hedley as part of a NCC England Field Unit survey, when some 295 plants were seen at TR 058 502. The next year, B. Pardon noted at least 50 plants on an east facing slope, TR 058 503.

Subsequent records included: presence noted by Eric Philp in 1996, published in Philp (2010); a sighting by Joyce Pitt c. 1993 at TR 057 701; very locally frequent (Francis and Pauline Rose, 2000); five plants found after two hours' search in June 2010 (Alfred Gay, TR 059 502); 46 plants in June 2012 (KBRG meeting, the majority within a 10 metre radius of TR 05886 50192); 163 plants in June 2013 (Alfred Gay, one flowering plant north of a small coombe at TR 05914 50298, and the rest scattered between TR 05889 50229 and TR 05845 50088, with hotspots at (1) TR 05890 50222, (2) TR 05886 50192 and (3) TR 05848 50092); 92 plants on three survey dates in June 2014 (Alfred Gay, echoing the 2013 distribution, with the single plant, the scattering of the rest and the presence of hotspots being similarly located); 36 flowering plants in June 2016 (Fred Rumsey and Alfred Gay); still present, 2018.

Godmersham, habitat, plants marked with red flags.. Photo by Alfred Gay, 30 May 2022

There was a count in 2019 (communicated by Tony Witts) for **196** plants, comprising 50 at TR 05841 50084; 37 at TR 05839 50079; 25 at TR 05836 50099; seven at TR 05852 50112; 72 at TR 05838 50091; one at TR 05853 50113; and four at TR 05880 50173 – it was apparently responding well to conservation measures. However, in June 2021 a thorough survey could only locate **49** plants, as follows-

Grid reference	No. of plants	Grid reference	No. of plants	Grid reference	No. of plants
TR 05835 50081	1	TR 05865 50112	2	TR 05893 50233	1
TR 05840 50085	10	TR 05892 50161	1	TR 05892 50234	1
TR 05843 50087	1	TR 05880 50166	1	TR 05891 50232	5
TR 05843 50093	1	TR 05910 50187	1	TR 05892 50235	1
TR 05837 50087	2	TR 05905 50195	3	TR 05891 50236	3
TR 05856 50109	2	TR 05909 50205	1	TR 05888 50236	1
TR 05856 50108	2	TR 05911 50226	2	TR 05892 50236	1
TR 05858 50108	1	TR 05896 50227	2	TR 05910 50228	1
TR 05859 50108	1	TR 05895 50229	1	**Total**	**49**

This appears to have been an anomalously low total. On 30 May 2022, **162** plants were recorded:

Grid reference	No. of plants	Grid reference	No. of plants
Between TR 05838 50095, TR 05832 50088 and TR 05830 50100	100	TR 05882 50188	4
TR 05839 50089	1	TR 05903 50207	10
TR 05843 50080	7	TR 05907 50234	1
TR 05850 50087	3	TR 05898 50237	1

TR 05857 50084	7	TR 05892 50237	1
TR 05858 50111	6	TR 05891 50240	1
TR05895 50170	1	TR 05885 50242	5
TR05888 50178	13	TR 05881 50243	1
		Total	**162**

The 2023 survey (31 May) produced a total of **194** plants:

7Grid reference	**No. of plants**	**Grid reference**	**No. of plants**
TR 05899 50247	1	TR 05873 50169	5
TR 05891 50238	31	TR 05883 50162	3
TR 05896 50230	1	TR 05888 50167	2
TR 05898 50167	10	TR 05889 50164	1
TR 05889 50172	1	TR 05852 50118	2
TR 05888 50177	1	TR 05859 50110	1
TR 05888 50183	1	TR 05861 50108	5
TR 05887 50188	1	TR 05859 50080	14
TR 05885 50187	3	Between TR 05832 50093 & TR 05848 50073	89
TR 05883 50180	4	TR 05853 50085	3
TR 05877 50179	1	Between TR 05810 50062 & TR 05815 50054	14

However, the 2024 survey (29 May) showed a substantial drop (**71** plants), mostly in similar positions to previous years, but a few outliers to the south and further down the bank.

Grid reference	**No. of plants**	**Grid reference**	**No. of plants**
TR05807 50059	3	TR 05856 50174	2
TR 05833 50091	10	TR 05877 50192	1
TR 05863 50098	1	TR 05879 50189	2
TR 05848 50115	1	TR 05885 50236	4
TR 05902 50173	4	TR 05888 50242	3
TR 05892 50181	20	TR 05887 50248	2
TR 05873 50168	1	TR 05917 50218	2
TR 05877 50241	5	TR 05846 50072	10

The site comprises chalk grassland on the east facing slopes of the North Downs where cut through by the Great Stour valley. It is sheep grazed, although cattle have been used in the recent past (the latter may have been more effective for the purposes of the Kentish Milkwort). The sward length has increased in places in recent years but at least in 2013, this has coincided with a substantial increase in the number of flowering Kentish Milkwort plants. However, the sward was in places noticeably higher in 2014 and this may be the cause of the diminution in the total number of plants for that year. There is a risk that *Brachypodium pinnatum* agg. (Tor-grass) may swamp less vigorous species, especially if there is a relaxation of the grazing regime. At the time of the 2013-14 surveys, *B. pinnatum* agg. was mostly confined to ridges along the terracettes, between which are extensive patches of short herb-rich grassland. The milkwort favours these patches of shorter grass where it often grows in association with *Carex caryophyllea* (Spring Sedge) and *Hippocrepis comosa* (Horseshoe Vetch). However, some plants do occur on the edge of the *B. pinnatum* agg. stands, perhaps where there has been some recent disturbance and the existing grass stands provide some protection from grazing animals.

The major diminution in Godmersham numbers in 2020 (albeit recovered since, although with another drop in 2024), however, raises a more fundamental question as regards population fluctuations of this species in Kent. *Polygala amarella* has been thought to be a perennial and if that is so, then it should not be at the same risk of yearly fluctuations as annual species. It has, however, been suggested that that the Kent plant often behaves as an annual and rarely persists beyond a second season of flowering, which may be a differentiation between this and northern British *P. amarella.* The short life of the Kent plants may be responsible for the more marked fluctuations seen in our county and perhaps has also has been responsible for the greater decline.

Ecology[573]

Polygala amarella is a small, short-lived perennial which has been more thoroughly studied in its northern England populations. There, most plants start flowering in their second and third years; they have a mean age of six to seven years. Flowering in the northern populations is from May to July, subject to variation according to altitude; in Kent, the flowering period is similar, but can get delayed by a late spring, as in 2013. Spread is by the relatively heavy seed, which may fall round the plant or be dispersed further by ants or grazing stock. The capsules drop intact with their seeds, in Kent often while the uppermost flowers have yet to open. Most seeds apparently germinate in the year after seed is set. So far as experience goes in relation to northern populations there is little innate dormancy in the seeds, but it may be that the filtration of red light by the vegetation of a closed sward could inhibit germination. There have been losses in northern populations through over-grazing. In Kent, under-grazing is a more likely cause, where leading to scrub colonisation or the loss of open habitat through the spread of *Brachypodium pinnatum* agg.

Description

Polygala amarella in Kent, it has to be said, is a small, generally rather dingy and inconspicuous plant, with pale mauve to greyish-white flowers. One population near Wye has apparently shown a wider variation, of white through pale pink to the normal pale greyish lilac. *Polygala amarella* is distinguished from other milkworts by having a basal rosette whose leaves are much larger than the leaves growing above; by the veins on the inner sepals not dividing up and rejoining very much; and by the flowers measuring no more that 5mm. The Kent populations differ from those growing further north by the dingier flower colour, and by other features. Fearn (1975) mentions that the wing sepals (2.6-4.2 mm) and capsules (2.4-3.8 mm) can be shorter than those of other populations, but there is overlap. She concluded that the Kent plants are morphologically distinct from the northern populations sampled, and that most of this variation is maintained in cultivation. Comparing with the intergrading of variation on the Continent, she considered that *Polygala amarella* was a single, polymorphic species with a number of races and that the degree of variation did not warrant giving subspecific status to the Kentish Milkwort. Nevertheless, there would seem value in doing so, to encourage the preservation of the genetic diversity of this distinctive plant.

(Re-) introductions

Plants were cultivated at Kew from seed collected at Godmersham in 2014. They were planted out by the Species Recovery Trust with Kent Wildlife Trust on 19th April 2021 at Fackenden Down and Queendown Warren, in locations (see below) which appeared suitable but did not have previous records, so there should be no issues of confusion of introductions with unexpected natural re-appearances of indigenous plants. There was a second planting at those sites on 20 October, when at Queendown Warren there was seen to be an additional *P. amarella* rosette close by the April plantings, which being c. 20cm from one of the original plantings, could only be from seed that was produced and germinated that year.

Fackenden Down, Otford/Shoreham introductions (first and second plantings)	**Queendown Warren, chalk bank below reserve introductions** (first and second plantings)
(1) 3 plants at TQ 53048 60341	(1) 4x plants at TQ 83027 62902 (south-facing side of bank)
(1) 3 plants at TQ 53049 60344	(1) 3x plants at TQ 83025 62918 (north-facing side of bank)
(1) 2 plants at TQ 53051 60331	(2) 5 plants at TQ 8303 6291
(2) 4 plants at TQ 5304 6035	(2) 5 plants at TQ 8303 6290
(2)3 plants at TQ 5304 6033	
(2) 3 plants at TQ 5305 6032	

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[573] Much of the information in this paragraph is based on the following sources:

Fordham, R.C. (1979). *An analysis of the population dynamics of Draba incana, Polygala amarella and Gentiana verna in upper Teesdale*. MSc thesis, Durham Theses, Durham University.

Walker, K.J. (2015). *Polygala amarella* Crantz Dwarf Milkwort. Species Account. Botanical Society of Britain and Ireland.

At Fackenden Down, no survivors of the plantings were seen in 2022. However, on 26 May 2023 one plant (assumed to be a survivor or progeny of this introduction) was found at TQ 53046 60357. The site still holds some potential for this species, with open areas present, but coarse vegetation and scrub (clematis, hawthorn) is much more prolific than when the site was chosen. No plants were seen on survey in 2024.

At Queendown Warren, the 17 plants introduced in 2021 had grown to 47 during summer 2023 and in late November over 50 plants were seen, many of which were still in flower. On 4 June 2024, plants were seen to have increased to 84. This site has been instructive as regards observations of an extended flowering period and the effectiveness for the milkwort of a bare chalk substrate with limited competition.

Further introductions were carried out on 23 October 2023 at Tom’s Hill, an arable reversion site on chalk c. 1.8km south west of the Godmersham colony, five plants at TR 04219 49312 and another five at TR0419 4929. Also, plantings were made on 15 November 2024 at Peter’s Pit SSSI on skeletal soil over chalk, at (1) TQ 71830 62799, five plants on a south-facing bank, directly opposite track leading to the arable reversion field, 2.5m below the top of the slope, none flowering at time of planting; and (2) TQ 71841 62788, five plants on a south-east facing bank, 3m below the top of the slope, none flowering at time of planting.

Acknowledgements

The compilation of this account has drawn, apart from various record sources, in particular upon the help provided by Alfred Gay and Fred Rumsey (papers as cited in footnotes) and Holly Stanworth.

Polygala serpyllifolia Hosé (Heath Milkwort)

vc15 and 16

Rarity / scarcity status

Heath Milkwort is frequent throughout the British Isles, other than much of central and east England, on acid grassland and heathland. Its threat status for conservation purposes in Great Britain as a whole is of 'Least Concern'. However a more recent assessment for England treats the species as **Near Threatened** (just), on account of its area of occupancy having been taken to have declined by 22% in comparing records for the periods 1930-69 and 1987-99. In Kent there is evidence of a decline of 66% between 1971-80 and 1991-2005 so that, while it is neither rare nor scarce in the county, the trend is concerning. As a Kent axiophyte, it is indicative of good habitat.

Brenchley Wood. Photo by Lliam Rooney, 12 May 2011

Account

The older botanists tended to lump milkworts together under *Polygala vulgaris*, in Britain at least until 1846. One could surmise that some such records, when associated with an appropriate habitat, should be *Polygala serpyllifolia*, for example those in Daniel Cooper's *Flora Metropolitana* (1836) relating to Blackheath, Dartford Heath and Keston Mark or Common. Our first record looks as though it is by Thomas Johnson in his *Descriptio Iter* (1632) noted on his journey between Canterbury and Faversham. It was listed by him with plants of acid ground, *Digitalis purpurea* (Foxglove) and *Hypericum pulchrum* (Slender St John's-wort); and Francis Rose in the 1972 edition of Johnson's work points out that his 'Polygala flo. caeruleo, Amarella Gesn. flos Ambervalis Dod.' Is almost certainly *Polygala serpyllifolia*, not *Polygala vulgaris,* in the acid Blean Woods, past which Johnson's journey, presumably along Watling Street, would have taken him. The first published record in which the milkwort was consciously distinguished (using the name *Polygala depressa*) from *Polygala vulgaris* was given in one of the instalments published in the *Phytologist* (1861)[574] of '*Notes and Observations made during a Week's Botanizing in South Kent…By a Correspondent*', as found on the way along the sandhills from Sandown Castle to Deal.

Hanbury & Marshall (1899) regarded it as a not uncommon plant of damp heaths and gravelly ground, and probably much commoner than the reports from their correspondents indicated. There are records from obviously acid heathy areas such as Hayes Common, Bostall Heath, the Blean, Rusthall Common, Westerham Common, Rusthall Common, Penenden Heath and Hothfield Heath. Marshall found it on gravel capping the chalk, which would have been acid, and this would also explain Duthie's record for Wye Downs (i.e. not the downland itself – Francis Rose saw it here in 1943 at a leached area on a plateau). Rose assessed it as a native of heathland, grass-heath and woodlands on acid soils with raw humus; very common in suitable places, but naturally absent from the marsh districts of the county and most of the chalk and clay areas. His records from the 1940-60s were, subject to those limitations, widespread across the county. On the north west Kent gravels it was present at Hayes Common, Keston Common, Chislehurst Common, St Paul's Cray Common, Joyden's Wood, Farningham Wood, Hollows Wood and Dartford Heath. There were a number of locations on acid soils around Canterbury such as the Old Park golf course, West Blean Wood, west of Rough Common and grass-heath north of Dunkirk. In 1946 it was recorded at Darenth Wood on the Blackheath Member of the Lambeth

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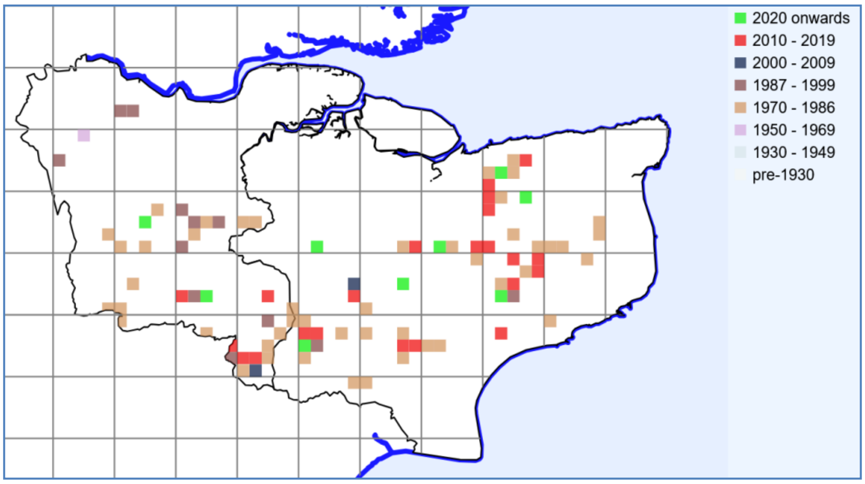
[574] Vol 5; at p213, not 210 as given by Hanbury & Marshall (1899).

Formation and at Shorne Ridgeway, where the geology is similar. There were occasional sites ostensibly on chalk, but where acid conditions actually prevailed, such as drift deposits at Magpie Bottom and leached chalk heath between Ringwould and St Margaret's. The Lower Greensand of West Kent provided sites at Crockham Hill Common, Brasted Chart, Seal Chart, Whitley Forest, Bitchet Common, Ightham Common, Oldbury Hill, Knole Park, Mereworth Woods and Oaken Wood Barming (this last site showed continuity from a specimen collected by H. Lamb in 1898 through to Francis Rose's sighting in 1956). Records also followed the acid sands of the Folkestone Formation from Wrotham Heath eastwards to Pendenden Heath, Hothfield, Ashford Warren, Willesborough Lees, Mersham-le-Hatch and Gibbon's Brook. The geology of south west Kent is also acid, accounting also for records made or collected by Francis Rose at locations such as Rusthall Common, Pembury Woods, Combwell Wood, Ellis and Tongs Wood Lamberhurst , Angley Wood and (where frequent in 1954) Bedgebury Forest.

Knole Park, habitat: short acid turf. Photo by Geoffrey Kitchener, 12 May 2024

This range is reasonably represented by 75 tetrad records in Philp (1982), when the species was reckoned to be locally frequent but never abundant, on heaths and woodland rides on sandy or gravelly soils. However, with the 1991-2005 survey of Philp (2010) the extent of occurrence is drastically depleted, with only 25 tetrad records. The impression is one of thinning out, but there are 13 hectad (10km squares) in which the milkwort could no longer be found at all in the county: TQ44, TQ45, TQ53, TQ54, TQ55, TQ74, TQ75, TQ92, TR03, TR04, TR16, TR24, TR25.



***Polygala serpyllifolia* Kent records to 2024 mapped at tetrad level, from BSBI database.**

In overall terms, the 2010-24 records show no further decline, totalling 31 tetrad records (36 monads) in comparison with the 25 tetrads given by Philp (2010). However, there is a clear discrepancy in that we are missing recent West Kent records other than for Knole Park, Bedgebury, Pembury and Marden Thorn. It would seem surprising that there is nothing for the north west Kent gravels and little for the West Kent Lower Greensand; and rather than assume absence, it is probably appropriate to undertake further survey. However, the results in general appear to affirm the comparison between earlier records (Philp (2010) coupled with the 1940s/60s records of Francis Rose) and later ones (Philp, 1982) in showing a decline.

The decline in earlier years may at least in part relate to loss of heathland habitat, although that trend was latterly reversed (see the account for *Calluna vulgaris*). Further aspects of the decline may be related to increasing deposits of atmospheric nitrogen, which has been found to affect plant physiology and species diversity in acid grassland. Payne *et al*. (2011)[575] consider that *Polygala serpyllifolia* would make a good indicator species for low-nitrogen deposition habitats. It is negatively affected by atmospheric nitrogen deposition and by soil nitrate content[576].

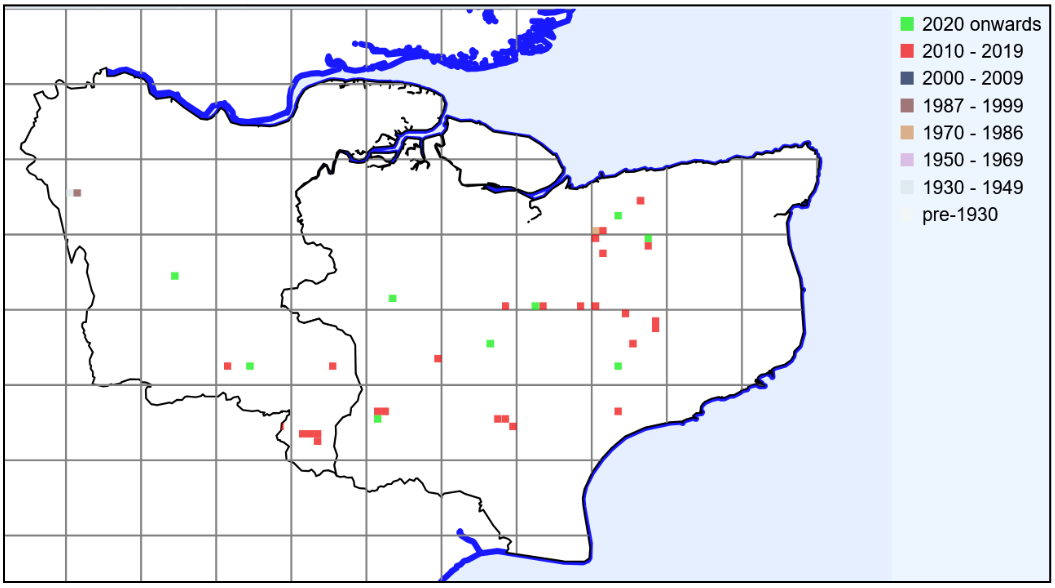
The historic position given by the BSBI database tetrad records, mapped here, shows a general scatter of sites in East Kent not re-found and is compatible with a general cause of decline such as nitrogen deposition. However, the deficiency of re-found records in West Kent may also be an artifact of recording.

Brenchley Wood. Photo by Lliam Rooney, 12 May 2011

Our recent records contain limited information as regards habitat, although it is clear that the plant is associated with acid grassland or woodland rides, including where clearance has been undertaken. Associated species include: *Calluna vulgaris* (Heather), *Hypericum pulchrum* (Slender St John's-wort), *Potentilla erecta* (Tormentil) and *Rumex acetosella* (Sheep's Sorrel).

Because of habitat preferences, there is only one other British species with which it is likely to be confused, *Polygala vulgaris* (Common Milkwort). They are most readily separated by the lower stem-leaves, which are opposite or near-opposite in *P. serpyllifolia* (evidenced by the position of the leaf scars if the lower leaves have dropped), alternate in *P. vulgaris*. The three outer sepals are usually acute at the apex; usually obtuse in *P. vulgaris.*

Polygala serpyllifolia **Kent records to 2024 mapped at monad level, from BSBI database.**



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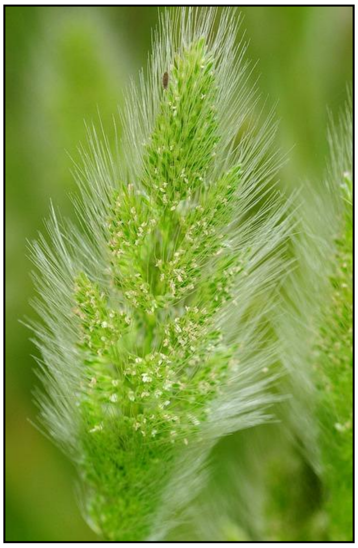
[575] Payne, R., Stevens C.J., Dise, N.B., Gowing, D.J., Pilkington, M.G., Phoenix ,G,K., Emmett, B,A, & Ashmore. M.R. (2011). Impacts of atmospheric pollution on the plant communities of British acid grasslands, *Environmental Pollution*, **159 (10)**: 2602-2608.

[576] Pannek, A., Duprè, C., Gowing, D.J.G., Stevens, C.J., & Diekmann, M. (2015). Spatial gradient in nitrogen deposition affects plant species frequency in acidic grasslands *Oecologia* **177**: 39–51.

Kent Rare Plant Register
Species accounts Part Polygo- Py



Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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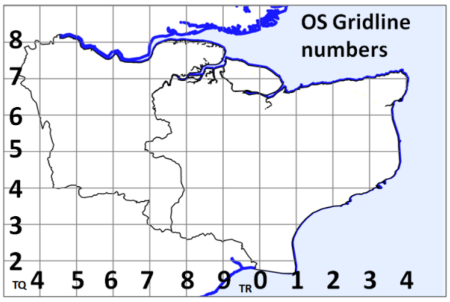
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AC Andrew Cross
ACH Andrew Henderson
AL Alex Lockton
ALw Alan Lewis
AY Alan M. Young
BB Brian Banks
BH B. Hadfield
BS Barry Stewart
BW Brian Woodhams
CA C. Alanine
CAO C.A. Ovenden
CD Chris Dyson
CDP Chris Preston
CEC Carter Ecological Consultants
CN Chris Newbold
CO Colin Osborne
CT C. Turner
DC Danny Chesterman
DG Doug Grant
DH D. Hobson
DK Dorothy Kenward
DS David Streeter
DW D. Williams
EGP Eric Philp
EW E. Wynter
FB Fred Booth
FK Faith Keymer
FR Francis Rose
GK Geoffrey Kitchener
GP G.Pell
GS Geoff Smith
HM H. Miller
HP H.B. Pollard
HS H. Sargent
HSt Holly Stanworth
HW Hector Wilks
JH J.H. Hemsley
IS Ian Sapsford
IW I. Welton
JA Jan Armitage
JBev Jim Bevan
JC James Cadbury
JCo J. Cornish
JEL Ted Lousley
JF J. Forsyth
JH Jan Hendey
JJ Janet John
JM Joumana Mobarak
JOM J.Owen Mountford
JP Joyce Pitt
JPu John Puckett
JR Julian Russell
JRP John Palmer
JS Judith Shorter
JW Jo Weightman
KBRG Kent Botanical Recording Group
KC K. Chandler
KF Kathy Friend
KFC Kent Field Club
KF-S K. Fidzcuk-Sterry
KJA Ken Adams
KO K. Obbard
KR K.N. Richardson
LR Lliam Rooney
NC Neil Coombs
NFS Nick Stewart
OL Owen Leyshon
PEG P.E. Gawen
PG-S P. Groen-Stocker
PH Peter Heathcote
PHC Rev. P.H. Cooke
PMH Peter Hollingsworth
PR Pauline Rose
PW Phil Williams
RAC Ray Clarke
RB Ros Bennett
RH R. Hanson
RJK R.J. Keymer
RL Richard Lansdown
RM Richard Moyse
RMB Rodney Burton
RoF Rosemary FitzGerald
RR Rosemary Roberts
RWR R.W. Robbins
SA Sheila Anderson
SB Sue Buckingham
SD S. Dickerson
SK Sarah Kitchener
SL Stephen Lemon
SP Sue Poyser
TI Tim Inskipp
TR Tim Rich
TS T. Swandale
V B-H V Benstead-Hume
VE Vicky Elder
WJM W.J. Morgan

Other abbreviations and references:

BM =Natural History Museum herbarium	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MOD = Ministry of Defence	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
Hanbury & Marshall (1899) refers to their *Flora of Kent*	MNE = Maidstone Museum herbarium	SLBI = South London Botanical Institute herbarium

Polygonum oxyspermum C.A. Mey & Bunge subsp. *raii* D.A. Webb & Chater (Ray's Knotgrass)

vc15; probably gone from vc16

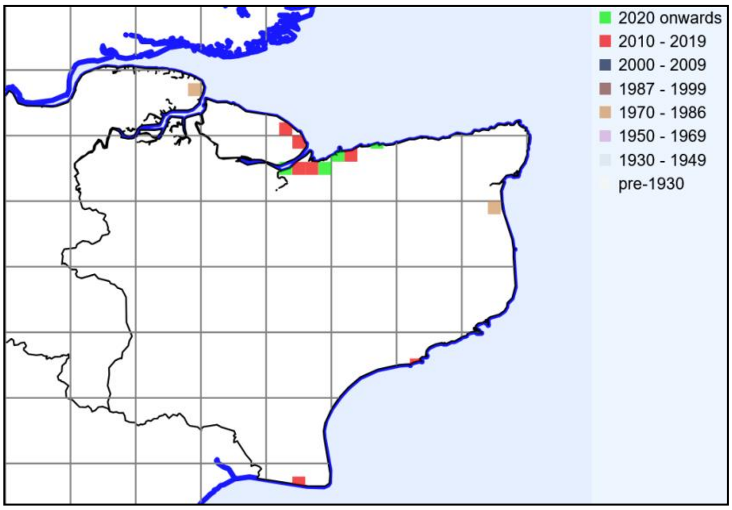
Rarity / scarcity status

Polygonum oxyspermum subsp. *raii* grows prostrate on the upper parts of sand, shingle or shell beaches around the coast of the British Isles. It is widely distributed, although less so in the east, and its threat status for conservation purposes is regarded as one of 'Least Concern', both in England and Great Britain as a whole. In Kent, it is verging on **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Graveney Marshes beach. Photo by Lliam Rooney, 28 August 2015

Account

Hanbury & Marshall (1899) give a first published record for Ray's Knotgrass as by Francis Bossey in 1839, in an excursion described in the *Proceedings of the Botanical Society of London* of that year, when it was claimed to have been seen on the ditch banks on the east border in the Plumstead military practice-ground. Hanbury and Marshall describe this as a most unlikely station and so it would have been. It is best discounted.[577] Otherwise, the oldest Kent record appears to be a specimen in Kew herbarium, gathered at Sandwich in January 1843.



***Polygonum oxyspermum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The species was regarded by Hanbury & Marshall (1899) as very rare on sandy or shingly beaches, and had been seen at Grain Spit, at Whitstable and on a sandy reach of land at the Sandwich end of Pegwell Bay, as well as by Marshall himself, in 1894, on the beach west of Sandgate. These sightings did not include Sheppey, which has suitable beaches, and it was recorded there, at the Isle of Harty, in 1938 by Lady Davy, and at Leysdown in 1955 by Donald Young. The north Kent and Sandwich locations continued to provide records for Philp (1982), whose 1971-80 survey noted the species in seven tetrads: at Grain, Sheppey, the north coast west of Seasalter as well as Sandwich Bay.

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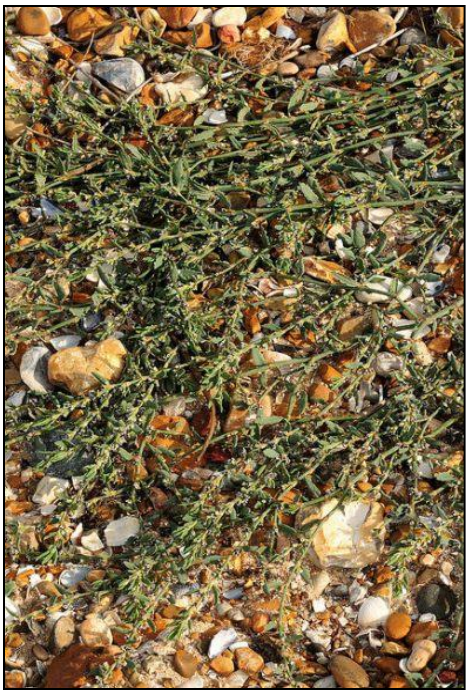
[577] There is a reference in the *Proceedings* to this '*Polygonum maritimum* of Ray' having been discussed at an earlier meeting, and an alternative version of the *Proceedings*, published in *the Annals of Natural History* (vol. 2, 1839) refers to Daniel Cooper having provided at an earlier meeting a paper of 'Observations on a variety of *Polygonum aviculare*, called *P. marinum* of Hudson, etc. occurring abundantly in the margin of salt-water ditches in Kent and Essex'. This reinforces the inappropriateness of the habitat for *P. oxyspermum*, and no doubt it was a form of *P. aviculare* which was involved.

Philp (2010) would appear to indicate that, at least in relation to the period 1991-2005, Ray's Knotgrass had declined. It was specifically searched for at all suitable localities, but only found in three tetrads: on Sheppey (Leysdown-on-Sea and Warden Bay) and at Whitstable. It is, however, a come-and-go plant, annual or sometimes perennial, and our records for 2010-24 cover eleven tetrads (16 monads), so it has either recovered or has been more fully recorded. Most records are on Sheppey or the related mainland, from Cleve Marshes eastwards through Whitstable (Tankerton) to Herne Bay. It is still some while since it has been seen at Grain (where suitability may have been affected by coastal defence works) and Sandwich (which should still be suitable). There are gains at Dungeness and an atypical record for Folkestone (a casual on shingle away from the strandline).

Overall, the species appears to be doing as well in Kent as it has ever done, if not better. There may be a parallel here with *Calystegia soldanella* (Sea Bindweed), *Eryngium maritimum* (Sea-holly) and *Glaucium flavum* (Yellow Horned-poppy): all shingle plants showing an increase in Kent records.

However, strandline plants are notoriously erratic in their occurrence, and it has been said (Akeroyd, 2014[578]) that it is unlikely that Ray's Knotgrass has appeared every year for any length of time on any one beach. Its appearances may depend on winter storm surges turning over beaches; it grows out of reach of ordinary tides. Some local spread may occur without this: a small plant found at Dungeness in August 2012 had, a year later, either grown through the shingle or had seeded a number of smaller plants around it. This last localised effect does not suggest the impact of storm surges, whereas the occasional occurrence as a singleton could. Some occurrences are of substantial colonies: over 100 plants at Herne Bay in 2013; 50-60 at Leysdown-on-Sea in 2010; 16 at Tankerton in 2010. We have no record of plant associates in Kent, although sometimes Ray's Knotgrass is sufficiently isolated that it appears misleading to refer to associates. Akeroyd (1994)[579] gives *Atriplex glabriuscula* (Babington's Orache), *Atriplex laciniata* (Frosted Orache), *Cakile maritima* (Sea Rocket) and *Salsola kali (*Prickly Saltwort), any of which one might expect to see in the same habitat in Kent, and there are recent records for all these in locations where Ray's Knotgrass has also been seen, although proximity is not mentioned.



Graveney Marshes beach. Photo by Lliam Rooney, 28 August 2015

Polygonum oxyspermum is distinguishable from the highly variable *Polygonum aviculare* (Knotgrass) by the glossy brown nuts being strongly exserted from the perianths; in *P. aviculare* they are non-projecting. Its leaves are also glaucous and fleshier than those of *P. aviculare*. It is also as well to check that plants are not *Polygonum maritimum* (Sea Knotgrass), which occupies similar habitats, although it has not been seen nearer to Kent than Brighton. The latter species does not have its nuts so far exserted, and has longer ochreae with 8-12 veins (4-6 with *P. oxyspermum*). The subspecies of *Polygonum oxyspermum* other than subsp. *raii* are not British plants (although subsp. *oxyspermum* has been recorded from Fife and

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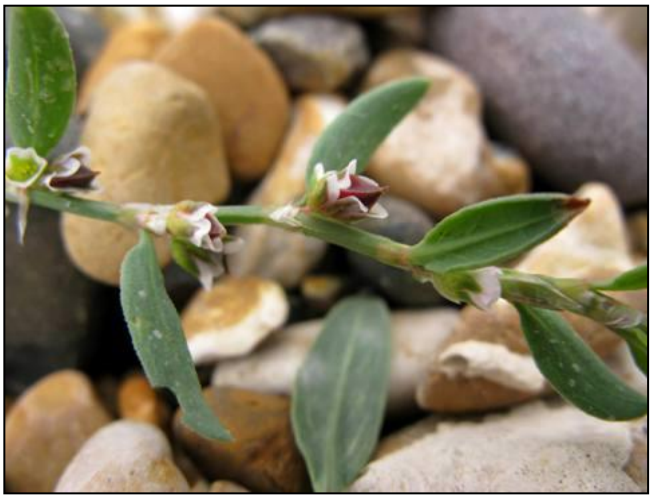
[578] Akeroyd, J.R. (2014*). Docks and Knotweeds of Britain and Ireland*. Botanical Society of Britain and Ireland, London.

[579] Akeroyd, J.R. (1994). *Polygonum oxyspermum* C. Meyer & Bunge ex Ledeb. Ray's Knotgrass. In (eds. Stewart, A., Pearman, D.A. & Preston, C.D.) *Scarce Plants in Britain*, JNCC, Peterborough.

East Lothian, perhaps originating from the Baltic); some of the records in the table below and the distribution map were given as plain *Polygonum oxyspermum*, but all are treated here as subsp. *raii.*



Tankerton. Photo by Sue Buckingham, 18 August 2010.

Site	Grid reference	Site status	Last record date	Recorder	Comments
South Bank of Swale Nature Reserve	TR0364	SSSI, local nature reserve	15 September 2021	KBRG meeting	A single plant on the shell bank at TR 03453 64751 with glaucous leaves, nuts clearly projecting from perianths, 4.5 mm long.
Leysdown-on-Sea	TR0370		13 August 2018	KBRG meeting	TR 03114 70997, shell-sand beach, near cross-beach barrier.
Lydd Ranges	TR0417	SSSI	(1) 12 August 2013 (2) 10 August 2012	(1) OL (2) OL (conf. TI)	(1) The small plant discovered in 2012 appeared to have grown or smaller plants had sprouted up around it. (2) TR 04449 17060, c. 100 m east of Galloways. Found following advice from a survey team for Environment.
Cleve Marshes	TR0464	SSSI, local nature reserve	18 August 2010	JA, LR	20 plants at TR 04220 64840.
Leysdown-on-Sea, Muswell Manor	TR0469		(1) 14 October 2010 (2) 1991-99	(1) SB (2) EGP	(1) TR 04314 69931, sand & shingle beach - 50 to 60 plants. (2) Recorded as TR06P, may be same location.
Cleve Marshes (east)	TR0564	SSSI, local nature reserve	12 July 2010	GK	TR 05372 64867, sandy shore.
Graveney Marshes	TR0664	SSSI	(1) 9 August 2016 (2) 28 August 2015	(1) C0 (2) LR	(1) One plant on top of shell beach near base of seawall at c. TR 0635 6485. (2) One plant on the shingle at TR 06364 64844.
Seasalter beach	TR0665	SSSI	6 September 2016	DC	TR 068 650, four plants near yacht club, with ordinary *P. aviculare*.
Seasalter (west)	TR0765		8 September 2016	AL,CO & LR	
Seasalter (west)	TR0865	SSSI	29 July 2017	AL	TR 0817 6508, a few plants by the slipway; recorded at species level.
Seasalter	TR0965	SSSI	(1) 10 October 2024 (2) 31 August 2017 (3) 9 October 2010	(1) & (2) AL (3) LR	(1) TR 0989 6580. Shingle beach. SD1 Glaucium flavum community. (2) TR 0983 6574; recorded at species level. (2) Shingle beach.
Whitstable west	TR1066		30 September 20213	AL & JM	TR 1011 6619.
Tankerton	TR1267		(1) 10 September	(1) JB	(1) several plants on shingle beach

			2012 (2) 18 August 2010	(2) SB	at TR 125 674. (2) TR 12208 67340, on the beach, 16 plants in 1 sq metre of shingle over sand.
Tankerton	TR1367		11 August 2019	DC	TR 13587 67697, one plant flowering on shingle.
Herne Bay	TR1768		(1) 18 June 2021 (2) 18 June 2014 (3) 12 June 2014 (4) 13 September 2013 (5) 19 September 2012 (6) 30 July 2011	(1) CO (2) CO (3) GK (4) CO (5) CO (6) JR	(1) Commonest on Harbour West beach and scarce on Harbour East beach. (2) Mainly east end of East beach but present as far as bandstand: doing well with plenty of seed. (3) Plentiful on sandy beach between bandstand and slipway car park, mostly at each end, TR 175 684 and TR 176 684, TR 177 684. (4) Five plants just east of Exercise equipment; 100+ east of bandstand; present below bandstand; a few west of bandstand. (5) East of bandstand, common. (6) TR 176 684, perhaps on introduced sand. By inner slip way area, about 20 plants.
Folkestone	TR2335		27 December 2016	GK & SK	TR 2315 3575, two plants on site of demolished building, shingly ground just south of Marine Parade, both still in flower. 125m from beach across level ground, but this has all been developed ground for many years, although now mostly cleared.

Polygonum rurivagum Jord. ex Boreau (Cornfield Knotgrass)

vc15 and 16

Rarity / scarcity status

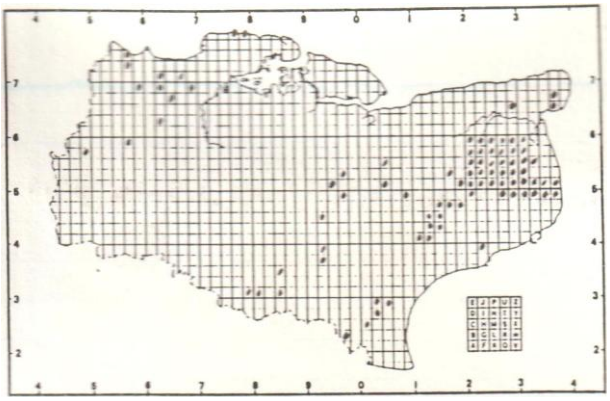
An ancient introduced annual (archaeophyte) of arable fields and occasionally waste places, *Polygonum rurivagum* is widespread in England and Wales, much less so in Scotland, and its threat status for conservation purposes is regarded as of 'Least Concern', both in England and Great Britain as a whole. From Philp (2010) it would appear to be in drastic decline in Kent, so as to become scarce. This appears to be an unduly pessimistic assessment and it is perhaps better regarded as uncommon / under-recorded. It is maintained on the register in view of the earlier indication of decline and the desirability of encouraging fuller record.

Account

The first documented occurrence of *Polygonum rurivagum* in Kent appears to be the citation by Hanbury & Marshall (1899) of a specimen from Deptford in the herbarium of Sir Joseph Banks (1743-1820). J.T. Boswell Syme (ed.), in vol. 8 of *English Botany* (1873), referred to it as a plant of cornfields 'Common in sandy and chalky districts in Kent'. *Polygonum rurivagum* was then commonly regarded as a form or variety of *Polygonum aviculare* (Knotgrass) and the records reported for the purposes of Hanbury and Marshall (including several made by F.J. Hanbury) relate to Eltham, Bromley, Grain, Cuxton/Halling, Lane End, Sheerness, Minster, Upchurch, Hatch Green, Canterbury, Fordwich, Sturry/Stodmarsh, Leybourne and Yalding. This distribution clearly excludes southern parts of the county, including the Weald and Romney Marsh, where arable was less frequent. In view of later developments, it is perhaps surprising that there was no record on the chalk at the eastern end of the county, but there is an 1878 specimen in the National Museum of Wales collected by Charles Bailey at Shakespeare' Cliff, Dover.

Ranscombe. Photo by Richard Moyse, 11 August 2015

In spite of Syme's reference to it as common, *Polygonum rurivagum* seems to have become sufficiently infrequent, or infrequently recorded, that Francis Rose thought it worth mentioning as one of his more interesting records, when he found it in 1958 on a cornfield on chalk at Pilgrims House, Trottiscliffe[580]. It is all the more surprising that Philp (1982) for the period 1971-80 gives 90 tetrads, although with the explanation 'Rather local but easily overlooked'. It is not possible from Philp (1982) to ascertain in what respects the species was local, as a map is not given, but the relevant map is given in the late Eric Philp's file cards and is reproduced here.



***Polygonum rurivagum* records 1971-1980**

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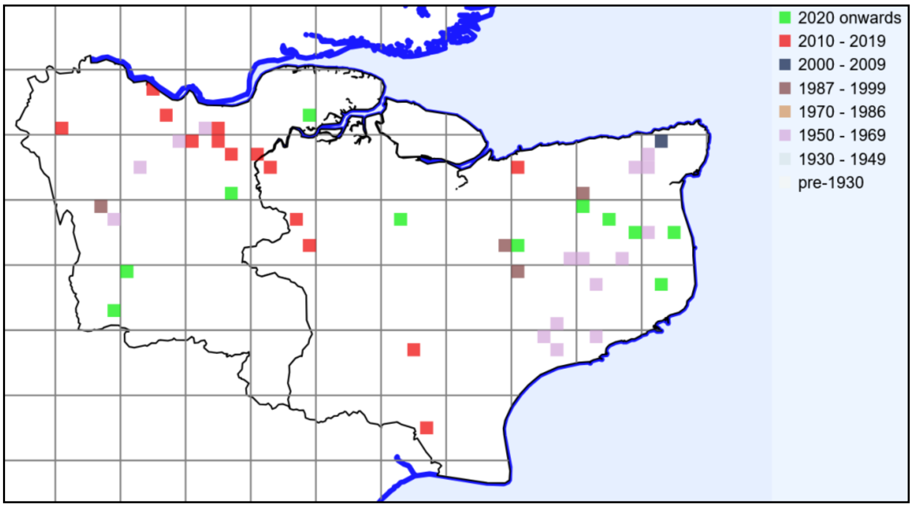
[580] Rose, F. (1960). Botanical records for Kent, 1955-58 – vascular plants. *The Transactions of the Kent Field Club* **1**: 56-65.

Particularly striking is the number of records in and around TR25 (south east of Canterbury and inland of Deal/Sandwich. This area is also significant for a concentration of records shown in the first national mapping of the species, in the *Critical Supplement to the Atlas of the British Flora* (1968); these were verified by B.T. Styles, the expert, who wrote up the taxonomy of *Polygonum rurivagum* and its allies in 1962[581]. It may be that the prevalence of *Polygonum rurivagum* here (and indeed, other interesting arable weeds) is related to the underlying geology, which is Margate Chalk Member (as distinct from, e.g. Lewes Nodular Chalk Formation and Seaford Chalk Formation, found elsewhere).

In contrast, Philp (2010) for the period 1991-2005 records only five tetrads for 'Plants fitting the description' (which suggests a degree of wariness about recording): namely, at Knockholt, Istead Rise, near Chilham, Waltham and Stodmarsh. So this is the second time round the cycle of the plant being regarded as not uncommon, and then being virtually unrecorded. That, however, is not the last word; and our most recent records add to the complexity of interpreting trends in this species' distribution. During the period 2010-24 records were made for 25 tetrads (28 monads). It is though we have something of the spread of the 1971-80 records in north west Kent, but lack almost completely the earlier spread of records in east and south east Kent.

Polygonum rurivagum Kent records to 2024 mapped at tetrad level, from BSBI database.



The tetrad distribution map lacks the 1971-80 records mapped above because they were not published as part of Philp (1982).

While *Polygonum rurivagum* may have shared something of the decline affecting arable weeds generally with changed farming methods and the use of herbicides, this does not seem an adequate explanation for the ups and downs of its frequency. It looks as if this is a taxon which has both presented difficulties in recording and is one which few recorders develop a knack of spotting. As for the ability to pick it out from *Polygonum aviculare* (Knotgrass), the BSBI database carries 15 or 16 scattered East Kent records in the mid-1960s by Barbara Nash; and there are 12 records for 2016-18, mostly from West Kent, by David Steere. No-one else is credited with more than two and there is no reason to suppose that the records are other than correct. This is a wider phenomenon than for Kent: Akeroyd (1994)[582] remarks 'Few recorders report it, but those that do seem to find it repeatedly'.

The difficulties of identification relate to its separation from the rest of the *Polygonum aviculare* complex, which has been divided into different species at various times[583], but its main constituent in Britain is currently *Polygonum aviculare*, which is very variable. *Polygonum rurivagum* is normally separated by:

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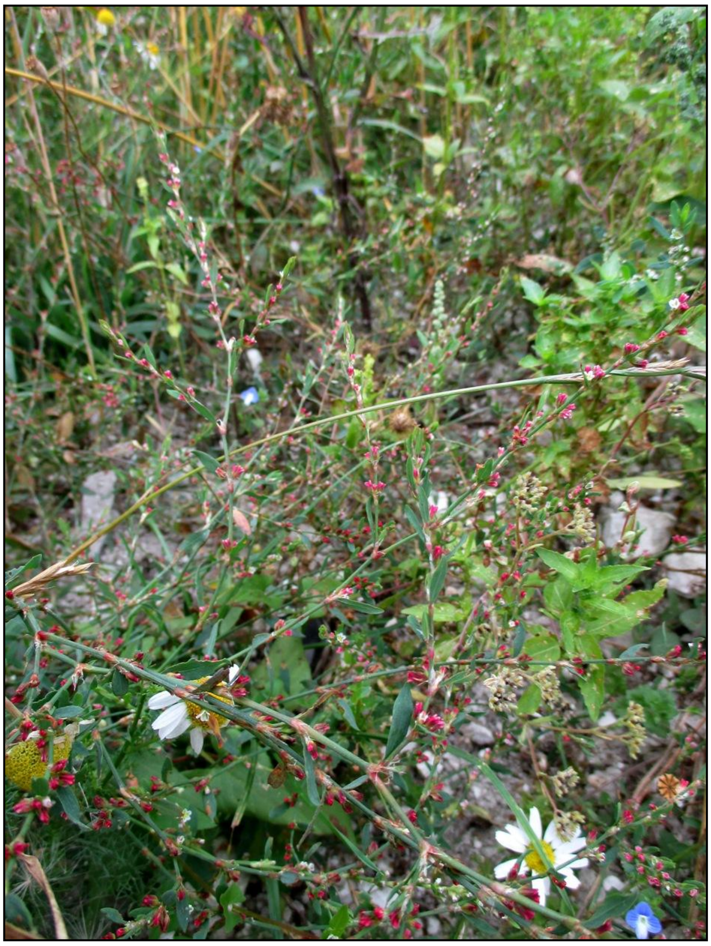
[581] Styles, B.T. (1962). The taxonomy of *Polygonum aviculare* and its allies in Britain. *Watsonia* **5**: 177-214.

[582] Akeroyd, J.R. (1994). Polygonum rurivagum Jordan ex Boreau Cornfield knotgrass. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

[583] Indeed, the 4th edition of Clive Stace's *New Flora of the British Isles* (2019) says 'Possibly best amalgamated with *P. aviculare*'.

- its (generally) more upright habit;
- its (usually) reddish flowers, as distinct from pink or white (normal with *P. aviculare*, but uncommon with *P. rurivagum*);
- its well divided tepals, whose edges do not overlap;
- its mature nuts projecting from the perianths, whereas those of *P. aviculare* rarely do so slightly and then not consistently); and
- its narrow stem leaves (N.B. there are two types of leaves and these are shed during the season; British Floras place a limit of 4mm on the width, but in Scandinavia up to 4.8 (-8.0)mm seems possible: more important is perhaps the relationship between leaf length and width –more than five times as long in *P. rurivagum*; less than five times *in P. aviculare*).

The qualifications given above as regards what is usual may reduce confidence in identification, and reduce the number of records made. Also, some aspects of descriptions are not easy to apply.[584] The easiest approach with this species is to look out for conspicuously red-flowered knotgrass plants, and then see how other characters stack up.



Ranscombe, habitat. Photo by Richard Moyse, 11 August 2015

While recent Kent records still include arable margin or fallow field sightings, Cornfield Knotgrass has also been seen in ruderal and roadside habitats. Nearly all recent records have been between late July and November, reflecting its late flowering and fruiting, which assists post-harvest seed dispersal. The quantity of these records is such that the species no long fulfils the scarcity criteria for inclusion in the rare plant register, but it is being retained in order to encourage a better understanding of its presence, in particular as regards the 'missing' East Kent distribution.

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[584] Akeroyd (2014), in *Docks and Knotweeds of Britain and Ireland*. Botanical Society of Britain and Ireland, London, says that *P. rurivagum* may be distinguished from *P. aviculare* by the large nuts - and then gives measurements in which the range of *P. aviculare* is larger instead.

Polypodium cambricum L. (Southern Polypody)

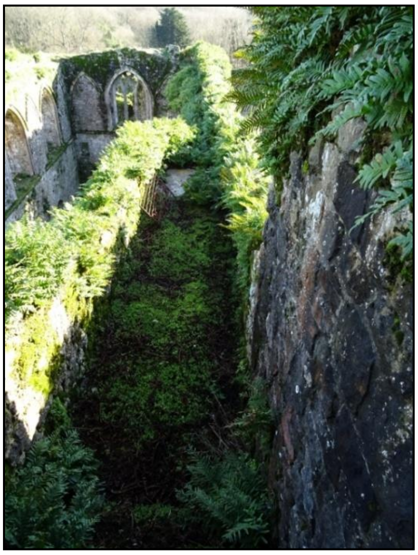
vc15 and 16

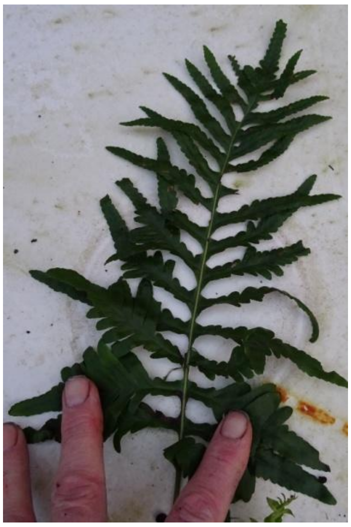
Rarity / scarcity status

Polypodium cambricum is a fern of base-rich rocks or mortared walls with a western distribution in the British Isles, but also extending along the south coast, diminishing eastwards. This distribution is sufficiently stable that the risk status of the species is one of 'Least Concern' in both England and Great Britain as a whole. It has, however, always been rare in Kent and, with no records in Philp (2010), it was initially placed on the county-'probably extinct' list. Despite the lack of record, colonies had continued to exist in both East and West Kent, so that at the end of 2015 Southern Polypody was removed from the 'probably extinct' list and included in the Kent rare plant register; but the species remains **rare i**n the county.

Account

Early records are perhaps obscured by the accepted treatment of this species generally as falling within *Polypodium vulgare,* until it was recognised that three subspecies (one of which, subsp. *serratum* or *serrulatum*, corresponds to the current concept of *P. cambricum*) differed cytologically as well as morphologically, and they were raised in 1961 to specific status. The three species were *P. vulgare* s.s. (Polypody), a tetraploid; *P. interjectum* (Intermediate Polypody), a hexaploid; and Southern Polypody, a diploid, then called *P. australe* Fée. This last name was superseded by *P. cambricum* when it was accepted that this Linnaean name had priority, even though originally applied to an unusual form of the species.





Saltwood Castle. Photos by Julian Reed, 28 January 2016.

Hanbury & Marshall (1899) refer to a specimen of *P. vulgare serratum* at **BM** as having derived from Saltwood Castle, collected by S.O. Gray (1828-1902), so this will have been a gathering of *P. cambricum*. Earlier information, however, is given in Thomas Moore's *Nature-printed British Ferns* (1859). Under the general heading of *P. vulgare*, two varieties are mentioned as found at Saltwood Castle by S.O. Gray, var. *semilacerum,* with its deeply serrate pinnae in the lower part of the frond and var. *crenatum,* described as approaching the previous form, but variable with rounded-lobed (rather than serrate), undulate pinnae. These appear to be part of the range of variation encountered with *P. cambricum*. '*Polypodium serratum'* was also given as part of a list of some of the rare plants found in the neighbourhood of Folkestone and Sandgate in a popular local guide of 1856, which went through many subsequent editions, so it enjoyed some prominence at the time.[585]

Thereafter, the presence of the species at Saltwood Castle does not seem to have attracted attention, although the buildings have been much photographed and it is evident that ferns are growing along the ruined walls in great quantity. A determination of *P. cambricum* was made by Julian Reed on 28 January 2016, when he found it so fully established as to be consistent with presence for many decades, if not for centuries. He also found considerable variation in frond shape, some of this consistent with the 19th century record of var.

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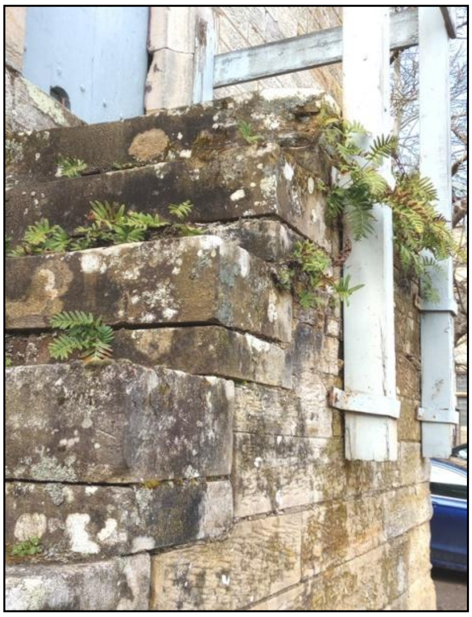
[585] Mackie, S.J. (1856). *English's Handbook of Folkestone for visitors*. The list apparently came from H. Ulyett.

semilaceratum (now treated as Semilacerum group). Most of the inner walls of the ruined parts of the castle then appeared covered with *P. cambricum*, and the outer walls and gatehouse.

Penshurst Place. Photos by Stephen Lemon, 3 September 2015.

In addition to this East Kent site, there is also one West Kent location for Southern Polypody, at Penshurst Place. It has probably been here for a very long time; Julian Reed has identified it from a photograph of a wall in the 1930s. It was not recognised before 1975 and/or 1976, however, when recorded by W.J. Morgan, giving a grid reference (which may not have been wholly accurate) of TQ 528 442, and identity was confirmed by Clive Jermy and Jim Crabbe. It was not re-found in the survey published as Philp (2010), but it appears possible that this may have been due to the inaccessibility of the colonies here, without entry into the grounds. Stephen Lemon in 2015 found some shed fronds below some *Polypodium* plants high up on the north east facing perimeter wall of Penshurst Place garden, of which he had been aware for a couple of years, growing spread between TQ 5290 4410 and around TQ 5293 4405. These enabled confirmation of identity. The population could be interpreted as seven separated colonies spread along the brick wall, the smallest an outlier consisting of just one plant and the largest consisting of at least 10 plants. The most luxuriant were growing in the shelter of Virginia-creeper leaves. The overhang of the brick batter capping the wall provides the main rooting zone.

Penshurst Place, courtyard site. Photo by Geoffrey Kitchener, 16 March 2023



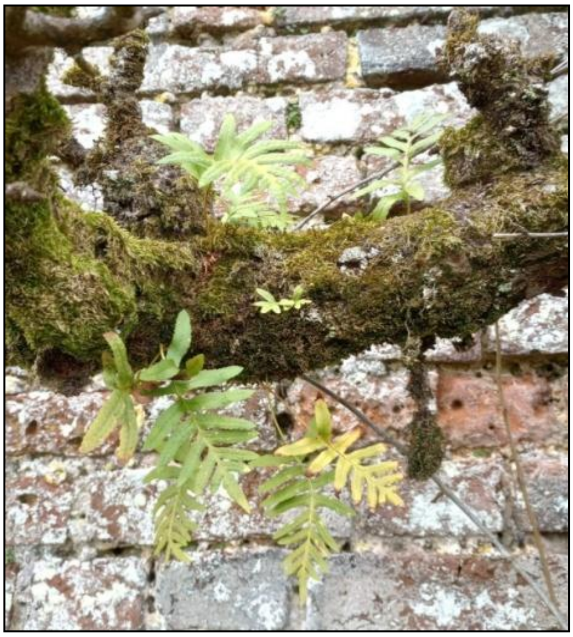
A sub-set of this site, a small colony 150m away, on stonework above the disabled toilet in a courtyard on the north east side of the Penshurst Place complex, TQ 52767 43997, was discovered by Geoffrey and Sarah Kitchener in February 2020. This proved indicative of a much more extensive distribution revealed on survey by Julian Reed and Geoffrey Kitchener on 16 March 2023. Survey details are given at the end of this account, but the fern was present in two main areas: the old bricks and stonework (sandstone) of the building complex, and the 16th-18th century brick enclosure of the walled garden. Habitats included

- the sloping batter towards the top of the brick garden walls (both north-east and north-west facing) on the outside;
- the top bricks of the vertical face of the garden walls (both south-east and south-west facing) on the inside;
- branches of espalier pears trained against the inside of the garden walls;
- the sloping batter and projecting ledges of stone walls in the building complex;

- the horizontal joints of stonework bearing stone steps from a courtyard to a high-level entrance to a building together with the upper stone risers.
- the base of the trunk of a lime tree in the lime avenue.

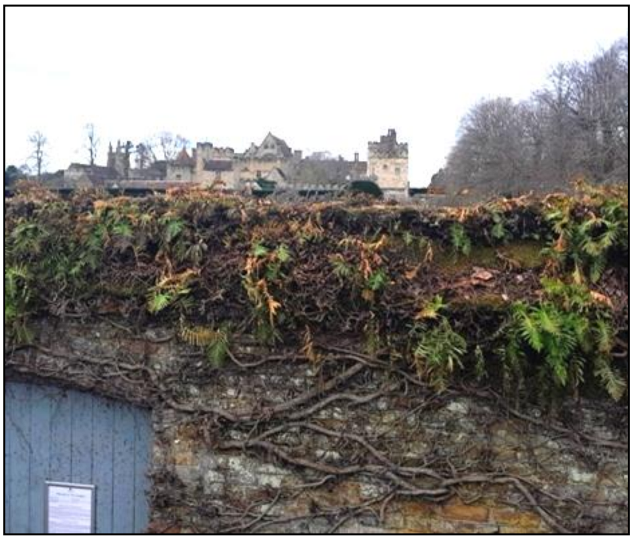
Most plants were present on brickwork rather than stonework; most were on the garden walls rather than the remaining built estate. Lime mortar will have afforded the base-rich substrate which the species prefers.

The Penshurst Place location appears less mild in climate than might be expected for this species in south east England, although *P. cambricum* cultivars are readily cultivated in West Kent, including within Julian Reed's national collection of *Polypodium*. It may be that there is a microclimate associated in particular with the garden walls. It was noted that on the south-eastern, internal face of the garden wall, ferns tended to flourish in the upper parts where sheltered by espalier pears, from which they had spread onto pear branches. There was even a wall colony where the pear had been removed and replaced by a young plant, leaving the colony exposed above and suggesting that it had established at a time when shelter had been afforded.



Penshurst Place, epiphytic growth on pear. Photo by Geoffrey Kitchener, 16 March 2023

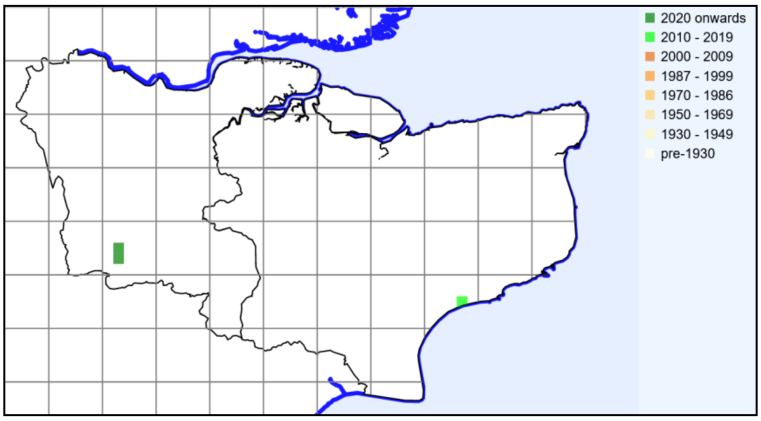
On the north-western, external side of the same wall, fern growth appeared to be more extensive and stronger, so it is not the southern aspect which is critical for success. Growth was mostly associated with the batter towards the top of the wall, and it may be that the slope provides some form of benefit. There were many areas in which mats of rhizomes had formed on the slope. Equally, there were gaps which might suggest that colonisation had been interrupted some time ago by spot repairs of the wall batter. There was a degree of association between strong fern colonies on one side of the wall and presence on the other, but not sufficiently consistent to draw conclusions; only in the northern corner did it seem that the colony was completely spread over the wall, top and both sides of the top.



Penshurst Place, main colony. Photo by Julian Reed, 16 March 2023

The core fern population was situated at the northern angle of the garden walling, running from here along both north-western and north-eastern wings, both internal and external. Virginia-creeper also grows here and the question arises as to whether this might be deleterious to the fern colony. On the whole, it appears not, and the overlay of creeper stems along the upper part of the wall may offer purchase for the fern rhizomes which is advantageous, assuming that the creeper stems do not cause issues with the wall itself (which neither Virginia-creeper nor the fern should be expected to do).

P. cambricum may be distinguished from the similar species *P. vulgare* and *P. interjectum* in that its fronds are proportionately wider (generally not more than twice as long as wide). Technical confirmation, however, requires microscopical examination of the sporangia, amongst which branched hair-structures called paraphyses should be present. There are also differences in the sporangia themselves: they have a dark brown annulus (red-brown in *P. vulgare*, pale in *P. interjectum*) with (4-)5-10 indurated cells and 3-4 basal cells, as compared with (7-)10-14(-17) indurated and 1 basal in *P. vulgare* and (4-)7-9(-13) indurated and 2-3 basal in *P. interjectum.*



***Polypodium cambricum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Penshurst Place Survey results, 16 March 2023			
	grid reference	**location**	**comments**
1	TQ 52775 43993	North-eastern courtyard, above disabled toilet.	Across 2m of joints in sandstone structure bearing stone steps, also in upper risers. Four outlying plants in stonework and two on neighbouring brick wall batter including junction with stone wall.
2	TQ 52796 43957	Courtyard east of Garden Tower, near tea room.	North-facing crenallated wall, corner by building, two low level plants on stone ledge, one higher up on wall batter.
3	TQ 52739 43928	South-western tower adjoining South Lawn.	In v-shaped angle on north side of tower, two small plants low down, behind ginkgo.
4	TQ 52761 44009	Boundary between north-eastern and north-western courtyards.	Two plants high up on brick arch dividing courtyards and spread over 0.5m of stone ledge on west (private) side of dividing wall.
5	TQ 52797 44014	Stone wall, north-eastern boundary of north-eastern courtyard.	Small plant on stone batter of stone wall.
6	TQ 52817 44058	Inner vertical face of north-western garden wall, private area.	Two small plants near top of brick wall.
7	TQ 52843 44072	Inner vertical face of north-western garden wall, private area.	1.5m coverage near top of brick wall and outlier, behind espalier pear.
8	TQ 52875 44093	Inner vertical face of north-western garden wall.	1.5m coverage near top of brick wall and growing on espalier pear, numerous.
9	TQ 52880 44097	Inner vertical face of north-western garden wall.	6m scattering near top of brick wall and growing on espalier pear.
10	TQ 52889 44102	Inner vertical face of north-western garden wall.	0.5m near top of brick wall behind espalier pear.
11	TQ 52891 44105	Inner vertical face of north-western garden wall	3m scattering near top of brick wall behind site of removed and replaced espalier pear.
12	TQ 52895 44109	Inner vertical face of north-western garden wall	Fairly close scattering near top of brick wall for 5m or so behind two pears to corner.
13	TQ 52901 44112	Junction of inner vertical faces of north-western and north eastern garden walls	Coverage for 9m along near top of north-eastern brick wall, inside.
14	TQ 52901 44112	Junction of outer faces of north-western and north-eastern garden walls with batter slope towards top.	Dense coverage of brick wall batter from corner south-eastwards to 1m beyond enclosing hedge, total about 12m. This is the main colony, growing with Virginia-creeper. Includes some frond variation, cf. Semilacerum Group, possibly Omnilacerum Group. In this colony, fronds extend to cover the top of the wall.
15	TQ 52926 44072	Outer face of north-eastern garden wall with batter slope	Coverage for 7m along brick wall batter, then scattered for another 4m south-westwards, with small outliers

		towards top.	beyond.
16	TQ 52940 44050	Outer face of north-eastern garden wall with batter slope towards top.	Coverage for 2m along brick wall batter, with outliers.
17	TQ 52814 44058	Outer face of north-western garden wall with batter slope towards top.	Plants on brick wall batter, both sides of north-western brick pier, and on other side of neighbouring pier, then groups of plants on the batter for c.8m north-eastwards.
18	TQ 52835 44070	Outer face of north-western garden wall with batter slope towards top.	Light scatter of plants for 1.5m along brick wall batter.
19	TQ 52842 44074	Outer face of north-western garden wall with batter slope towards top.	Light scatter of plants for 2.5m along brick wall batter.
20	TQ 52851 44079	Outer face of north-western garden wall with batter slope towards top.	To right of gate in wall on brick wall batter and to top, 2.5m, colony not carrying through to inside.
21	TQ 52863 44087	Outer face of north-western garden wall with batter slope towards top.	2 plants.
22	From TQ 52872 44093 to TQ 52901 44112	Outer face of north-western garden wall with batter slope towards top.	Present on brick wall batter for c. 33m to end of wall, becoming dense and forming a wing of the main colony, growing with Virginia-creeper. In this colony, fronds extend to cover the top of the wall.
23	TQ 52899 44123	The Limewalk.	Small plant at base of trunk of lime tree in avenue.

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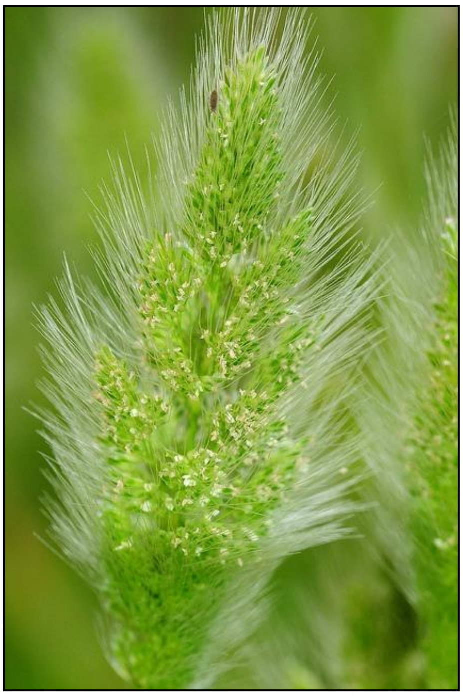
Polypogon monspeliensis (L.) Desf. (Annual Beard-grass)

vc15 and 16

Rarity / scarcity status

Annual Beard-grass is a plant of brackish places near the sea or estuaries, mostly in the southern part of the British Isles, with concentrations around the Thames estuary and the Solent. It is classed as **nationally scarce**, although its threat status for conservation purposes is assessed as of 'Least Concern'. In Kent, it is neither rare nor scarce, and there is some evidence of recent spread.



Sheppey. Photo by Lliam Rooney, 5 July 2012

Account

The first published county record appears to be Thomas Johnson's record, in his *Descriptio Itineris* (1632), of 'Alopecurus maxima Anglica paludosa Lob.' which was accepted by Hanbury & Marshall (1899) as likely to be *Polypogon monspeliensis.* Francis Rose, in the 1972 edition of that work, agreed, placing Johnson's locality as probably along the Swale estuary, or near Strood, or in Milton Creek.[586] Johnson, from his edition of Gerard's *Herball* (1633) also knew the plant elsewhere in Kent, as a 'Fox-taile...which grows naturally in many watry salt places of this kingdome, as in Kent by Dartford....The stalkes of this plant are grassy, and some two foot high...The eare is very large, being commonly four or five inches long, downy, soft like silk, & of a brownish colour'. Hanbury & Marshall (1899) regarded the species as a rare and very local native of submaritime marshes and ditches; their records were near the north coast of the county, and also at 'Sandwich Flats, on the margin of the ditches inside the River-wall' (a classic type of habitat).

Francis Rose knew of it as a grass of brackish marshes and alluvial dikes, usually on mud drying out in late summer, where it was very rare, but locally plentiful. The main records for the 1940s to 1960s were on the Hoo peninsula and on Sheppey. There were also sightings of Annual Beard-grass as a casual at Sandwich, Comp and Wrotham, where introduced by the use of wool shoddy as an agricultural fertiliser.

These inland occurrences had more or less died out by the time of the 1971-1980 survey covered by Philp (1982). While this noted occasional introductions inland, the records (17 tetrads) were still concentrated on Hoo/Grain, where found in damp meadows, brackish marshes and ground disturbed by cattle or vehicles. The 17 tetrads of 1971-90 became 25 tetrads in 1990-2005 (Philp, 2010) although the focus remained around Hoo and Sheppey, so the increase could have been explicable by the intensity of recording. However, more recent records (2010-24) give 82 tetrads (108 monads) and it is clear that there has been a significant extension of recorded range.

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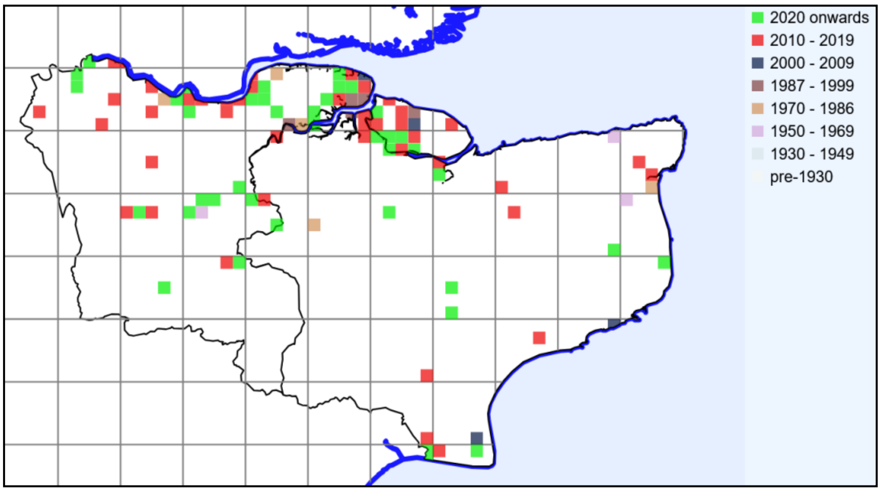
[586] Rose also speculated as to whether the same species was intended by Johnson's Sheppey record, in his *Iter Plantarum* (1629), referring to 'Gra. Tomentosum & acerosum Calamagrostis quorundum Lob.'. This had been interpreted by Hanbury & Marshall (1899) as *Calamagrostis epigejos* (Wood Small-reed), but Rose suggested that *Polypogon monspeliensis,* which grows in Sheppey, was just as likely. It seems odd to suppose that Johnson would give such different names to the same species (and Rose accepted the name as applying to *Calamagrostis epigejos* in *Descriptio Iter*!); but Johnson clearly had in mind what was illustrated by Lobelius' *Plantarum seu stirpium icones* (1576), where a tall plant looking more like *C. epigejos* than *P. monspeliensis* is shown.

The apparent increase in occurrences runs counter to what had earlier been considered to be the the national position, where some decline is thought to have taken place with conversion of arable to grazing marshes and the drainage or infilling of backish pools. In about 1990 *Polypogon monspeliensis* covered several acres of the Cleanaway site in the Essex part of TQ57J, which has certainly contributed to its greater frequency on both sides of the Thames since, though the site itself is now under a more permanent grass (Rodney Burton, personal communication). However, the national position has, according to *Plant Atlas 2020*, been affected by a very substantial increase in the 21st century of ruderal inland occurrences. These, so far as Kent is concerned, are discussed further below.



***Polypogon monspeliensis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Polypogon monspeliensis is now found along the Thames estuary westwards of the Hoo peninsula, although the westernmost location is on the north side of the Thames, in that anomalous part of vc16 which is surrounded by Essex. Presence at Dungeness has also strengthened, but what is particularly noticeable is the number of inland records. These fall into a number of categories:

- There is possible evidence of introduction through sown roadside grass and proprietary compost.
- Urban street occurrences may be derivative from bird seed, but there is the possibility of transmission on vehicle tyres, as with other saltmarsh grasses. However, it is not seen in quantity along main road verges affected by highway de-icing salt, as are *Puccinellia distans* (Reflexed Saltmarsh-grass) and *Parapholis strigosa* (Hard-grass), although it was found in 2018 below the A21 overbridges at Haysden, where salt run-off had brought a number of halophytes onto the semi-bare gravel below.
- There are occurrences related to present or former sand or gravel quarries, at Chipstead Lakes (now a sailing lake); Sevenoaks Sand Quarry (still operational); Darenth Road Quarry, Dartford (used for materials supply); Hale Street (sand quarrying activities apparently being wound down, but records here over three monads); Wrotham Quarry (infilled part of sandpit and Addington Sand Quarry). It is possible that, where such a location is being used for reception / storage / transmission of materials, *Polypogon monspeliensis* may have come in with the movement of vehicles and materials from an estuarial site such as Cliffe, where off-loaded by the Thames (where the grass has been recorded). Where this origin seems unlikely, seed transmission is probably by birds, especially where the habitat includes a waterbody with shallow margins.

Kent coastal or estuarial sites are also often on sandy gravel, but also on London Clay, generally close to pools, ditches, dikes and the hopes or fleets which represent original water channels from reclaimed saltings. The grass grows where cattle have trampled the ground, keeping it open for seedling germination and establishment. Gray (1994)[587] refers to associates in such habitats as including *Agrostis stolonifera* (Creeping Bent), *Tripolium pannonicum* (Sea Aster), *Bolboschoenus maritimus* (Sea Club-rush), *Juncus gerardii* (Saltmarsh Rush), *Ranunculus sceleratus* (Celery-leaved Buttercup) and *Salicornia* species (Glassworts). These species are very much what we would expect to find in Kent sites; *Hordeum marinum* (Sea Barley) also has similar habitat requirements for saline disturbed ground and we have noted it growing with *Polypogon monspeliensis.*

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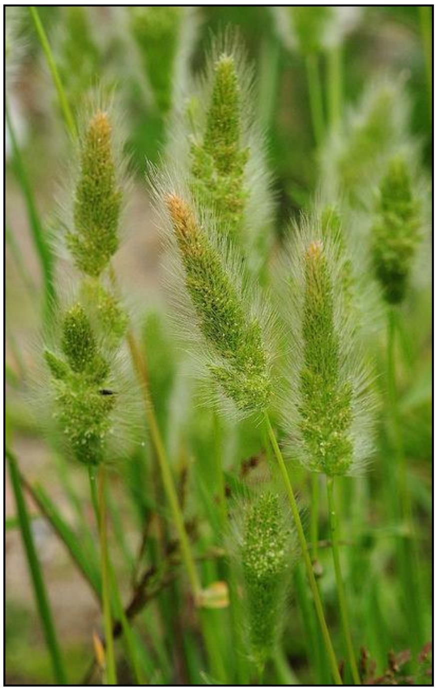
[587] Gray, A.L. (1994). Polypogon monspeliensis (L.) Desf. Annual beard-grass. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

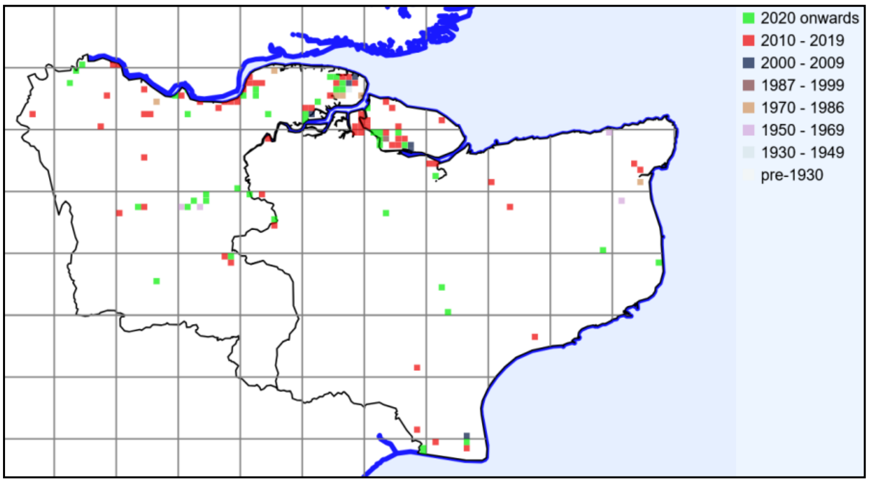
Cope & Gray (2009)[588] state that seeds seem to survive for many years in the soil-bank, as disturbance of former sites by activities such as ditch clearance or the construction of new sea walls takes place. Where the disturbance is of an extensive character, the resultant colonisation and seed production can be enormous: a six acre cleared site at London Medway Commercial Park, Hoo, in 2018 held millions of plants, ranging from large to minute.



Sheppey. Photo by Lliam Rooney, 5 July 2012

Oare Marshes, habitat. Photo by David Steere, 28 June 2016

With its dense, long-awned panicles, *Polypogon monspeliensis* is unlikely to be confused with other grasses. While *Lagurus ovatus* (Hare's-tail) might be supposed to bear a passing similarity, Hare's-tail's soft, near-globose white panicles are distinct from the greenish-white panicles of *Polypogon monspeliensis* which go brown and disarticulate with age. The latter does, however, hybridise with *Agrostis stolonifera* (Creeping Bent) to produce X *Agropogon lutosus*, whose panicle is somewhat branched (as in the *Agrostis* parent) and lemmas awned (not usually so, in the *Agrostis* parent) but whose spikelets do not disarticulate with age (as distinct from the *Polypogon* parent). This hybrid has been known in Kent at least since 1803 (when the specimen figured in Smith's English Botany as *Agrostis littoralis* was gathered at Woolwich) and has been found 17 times during the period 2010-22, at Sheppey, Chetney Marshes, Faversham, Borough Green and the Hoo peninsula.



***Polypogon monspeliensis* Kent records to 2024 mapped at monad level, from BSBI database.**

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[588] Cope, T. & Gray, A.L. (2009). *Grasses of the British Isles*. Botanical Society of the British Isles, London.

Populus nigra subsp. *betulifolia* (Pursh) Dippel (Black-poplar)

vc15 & 16

Rarity / scarcity status

Populus nigra subsp*. betulifolia* is a tree widespread in the British Isles, other than in Scotland, and is regarded as native, a pioneer of river valleys, but has been so widely planted as to obscure its native status. Trees are most frequently male and the fact of planting can generally be inferred from DNA fingerprinting analysis by which individual clones may be identified as widespread and presumably introduced as cuttings. Its conservation risk assessment for Great Britain as a whole is one of 'Least Concern'; similarly as regards England, although not listed to subspecies. In Kent it has been variably treated as planted or as a very scarce native. However, the current view is that is has generally been planted here, but there are two instances where DNA testing has shown trees or saplings not matching any of the usual planted clones, and which have arisen through sexual reproduction, so being capable of treated as native to the county. Their status is very **rare** in Kent.

Ivychurch. Photo by Stephen Lemon, 5 August 2023

Account

Poplar boards are listed as having been provided for repairs to Rochester Castle in accounts of 1367-1368/69[589]. Black-poplar was a traditional wood for such purposes, but the reference is not conclusive as regards local origin. The first Kent botanical record appears to have been by Edward Jacob in his *Plantae Favershamienses* (1777), where he refers to' Populus nigra, The Black Poplar', as being '*In moist boggy Places in* Hernhill – *not uncommon'*[590]. Hanbury & Marshall (1899) considered it to have been always planted, present in woods and hedgerows, and likely to have been reported sometimes in error for one or other of the allied N. American species. Such species and their hybrids were increasingly introduced in the late 18th and early 19th centuries, such that it has been reckoned that virtually no ordinary European Black-poplars were planted in Britain for 125 years from 1850.[591] The date of introduction to Britain of one of the earliest hybrids (and one which has often been confused with *P. nigra*), *Populus* x *canadensis*, is given by *Plant Atlas 2020* as 1787. Jacob's record looks unlikely to have been anything other than *P. nigra*, although this does not rule out a set of plantings of *P. nigra*, and it does not seem to have given rise to continuity with any subsequent record.

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[589] There were 28 boards bought of John Burgeys, carpenter, according to L.B. Larking (1859). Fabric Roll of Rochester Castle, *Archaeologia Cantiana* **2**: 111-132. He was one of the more skilled carpenters, working at 5½ d per day (others ranged from 3d to 6d) and the only one who is listed among the wood suppliers (which may suggest local preparation of the boards rather than a timber merchant who may have imported). Perhaps the same person as John Burgeys of Ealding (Yalding) who made his will on 4 October 1381.

[590] This may be reflected in the Tithe Commutation Award Schedule for Hernhill (1840), where John Foreman was recorded as owning and farming several land parcels called Alder Bed Marsh and a field laid to hops whose name presents transcription difficulties, but appears to be Poplar Field.

[591] White, J. (1993). Black Poplar: the most endangered native timber tree in Britain. *Forestry Commission Research Information Note* 239.

Francis Rose agreed with Hanbury & Marshall (1899) in supposing all Kent trees to have been planted. He gave a few records, including: a 140’ tree at Fairlawne noted as mentioned by H.L. Edlin in *The Living Forest* (1958). Philp (1982) took Black-poplar to be introduced in Kent, noting only a tree at Bough Beech and a young sapling on the ruins of Shornmead Fort (and listing planted Lombardy-poplar separately). However, Philp (2010) gave the species as native, said nothing about planting, and as well as the trees mentioned in Philp (1982) referred to plants at the edge of Bedgebury Forest, a fine stand of stunted trees on St Mary’s Marsh (Hoo) and a record at Dymchurch (since re-determined as *Populus* x *canadensis,* Hybrid Black-poplar).

Shornmead fort. Photo by Stephen Lemon, 9 July 2023

The issue of native status of *P. nigra* subsp. *betulifolia* (and in some cases, separation from closely related taxa) in Kent cannot be satisfactorily addressed without DNA analysis. The systematic assessment of clones in England and Wales began with an initiative by Forest Research in 2007. The initial results (A’Hara *et al.,* 2009)[592] did not include any Kentish data, but a follow-up (Cottrell *et al*., 2018)[593] listed seven West Kent trees (five male, two female) representing three different clones, two of which were common elsewhere in England and one of which was infrequent. Extensive research was undertaken by Stephen Lemon in 2023, with the participation of John Puckett and Sue Buckingham, and this provides the baseline of our knowledge of Black-poplar in Kent, reported by Lemon *et al. (*2024).[594] The results are included in the following table, based on Stephen Lemon’s assembly of a master set of Kent records claimed as *P. nigra*.

This table comprises Kent records made of *Populus nigra* (excluding cv. ‘Italica’), including where DNA analysis has shown that a different taxon is involved.[595]				
Site	**Grid reference**	**Relevant previous records**	**DNA test result**	**Comments**
Norwood Country Park	TQ3568	After 2009, before 2019	Cotterell *et al.* (2018): ***P. nigra***, clone 40	TQ 356 683, male tree.
Ladywell	TQ3773, TQ3774	After 2009, before 2019	Cotterell *et al.* (2018): ***P. nigra* subsp. *betulifolia*,** clone 28	TQ 3741 7366 and TQ3746 7442, male trees, urban park.

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[592] A’Hara, S., Samuel, S. & Cottrell, J. (2009). The role of DNA fingerprinting in the conservation of native black poplar. *British Wildlife* **21(2):** 110–115.

[593] Cottrell, J., A’Hara, S. & Adams, K. (2018) *Conservation of black poplar: insights from a DNA fingerprinting approach*. Research Note FCRN034, Forestry Research, Forestry Commission.

[594] Lemon, S., Buckingham, S., Kitchener, G. & Puckett, J. (2025) Reassessing the status of black-poplar *Populus nigra* L. subspecies *betulifolia* (Pursh) W. Wettst. ex Buttler & Hand., in Kent (vice-counties 15 and 16) with the benefit of DNA fingerprinting and an analysis of historic evidence. *The Kent Naturalist* **2:** 3-27.

[595] The table has been assembled by amalgamation of tables given in Lemon *et al.* (2025), supplemented with details from underlying records.

Maze Hill, Greenwich	TQ3977	2002	[Not surveyed, 2023]	
Westcombe Park, Greenwich	TQ4077	2002	[Not surveyed, 2023]	
(near) Westerham	TQ45	26 August 1921 (RWR)	[Not surveyed, 2023]	Insufficient record detail to enable re-finding of tree.
High Elms	TQ4462	1966 (JRP)	[Not re-found when surveyed by SL and JP, 2023]	TQ 440 624.
Hawkwood Estate, Bromley	TQ4468	2008 (JH)	2023 survey: ***P. x canadensis***	TQ 44034 68821.
Avery Hill	TQ4474	27 July 2013 (LNHS meeting)	[Not surveyed, 2023]	Long line of planted trees, extending from corner of Avery Hill Park at TQ 446 741 to T Q441 739.
Shooters Hill	TQ4476	2002 (FK)	[Not surveyed, 2023]	A row of female trees on Golf Course boundary opposite Clothworkers Wood [probably TQ 447 768].
Orpington	TQ4564		2023 survey; ***P. nigra*** **subsp. *betulifolia***, clone 32	TQ 45690 64706, female tree with pruned limbs, urban street (Sevenoaks Road), surveyed 22 July 2023 (SL & JP).
Sidcup	TQ4571	2 June 1995 (DW)	2023 survey; ***P. nigra*** **subsp. *betulifolia***, clone 32	TQ 45926 71706, female tree, urban street.
Tripcock Ness	TQ4580	(1) After 2009, before 2019 (2) 26 May 2006 (KJA)	Cotterell *et al.* (2018): ***P. nigra*** **subsp. *betulifolia***, clone 28	TQ 451 807 and TQ 452 808, male trees, river bank, latter on former factory site. 2006 records refer to 100-120 male trees, either coppiced or resulting from close planting, near site of Canon Cartridge Works. Also low-cut pollards on Thames bank just W of the beacon, TQ 452 808.
Foots Cray	TQ4771	(1) After 2009, before 2019 (2) 2000 (AY)	Cotterell *et al.* (2018): ***P. nigra*** **subsp. *betulifolia*,** clone 32	TQ 476 712 and TQ 476 715, female trees, old parkland. Survey on 20 August 2023 (SL) provided records in five locations at Foots Cray Meadows, singletons and groups, many of which are understood to have originated as cuttings from a female tree in the churchyard.
Danson Park	TQ4775 (IW)	2002	[Not surveyed, 2023]	Horticulture hut and 'The Stables', introduced.
Bough Beech	TQ4846	Recorded in Philp (1982, 2010), i.e. present after 1970 and before 1981; and after 1990 and before 2000.	2023 survey; ***P. nigra*** **subsp. *betulifolia***, clone 34	TQ 48880 46980, male tree, bank above pond in garden, former farmyard. Surveyed 9 July 2023 (SL).
Erith Marshes	TQ4879 (PHC)	4 October 1937	[Not surveyed, 2023]	Insufficient record detail to enable re-finding of tree.
Crockenhill	TQ5066	2001	2023 survey: ***P. x canadensis***	TQ 50454 66496.
Otford	TQ5158 / TQ5159	1953, 1993 (SD, as TQ 518 590)	2023 survey: ***P. nigra*** **subsp. *betulifolia* x *P. nigra* 'Italica'**	TQ 51796 59003 and TQ 51805 58993.
Penshurst Park	TQ5243	1913	[Not surveyed, 2023]	Insufficient record detail to enable re-finding of tree.
Sutton at Hone	TQ5570	1986 (JH)	[Not re-found when surveyed by SL, 2023]	TQ 558 704, St. John's Jerusalem, assumed planted.
Stone	TQ57S	23 May 1977	[Not surveyed, 2023]	'Plantierensis', waste ground. [Habitat is likely to have changed since and insufficient record detail to enable re-finding of tree.]
Horton Kirby	TQ5668	16 June 1994 (CAO)	[Not re-found when surveyed by SL and JP, 2023]	TQ 560 685; bank of River Darent, near mill.
Fairlawne Park	TQ6053	1985 (HP)	2023 survey; ***P. nigra*** **subsp. *betulifolia***, clone 34	TQ 60087 53381, male tree, isolated old parkland, wide trunk but brokem off half-way up so has lost original height. Surveyed 15 July 2023 (SL).
West Court Meadows, Gravesend	TQ6673	1957	[Not surveyed, 2023]	Farmland habitat has changed into a housing estate and insufficient record detail to enable re-finding of tree.

Birling Ashes	TQ6859	March 1992 (JF)	2023 survey; ***P. nigra* subsp. *betulifolia***, clone 23	TQ 68463 59864, male tree, road-bank at edge of garden near stream, surveyed 3 August 2023 (SL).
Leybourne Lakes	(a) TQ6960	23 July 2008 (BW)	2023 survey; ***P. nigra* subsp. *betulifolia*,** clone 28	TQ 69639 60344 and TQ 69650 60346, male trees, north-western corner of car park of country park at former gravel pits. Surveyed on 13 August 2023 (SL) and the tested trees are part of a line which includes a tall narrow tree, the hybrid in the following entry.
Leybourne Lakes	(b) TQ6960		2023 survey: ***P. nigra* subsp. *betulifolia* x *P. nigra* 'Italica'**, matching to an Irish tree of this cross.	TQ 69628 60342, north-western corner of car park of country park at former gravel pits.
Shornmead Fort	TQ6974	Recorded in Philp (1982), i.e. present after 1970 and before 1981; and in Philp (2010) on 17 December 1992.	2023 survey; ***P. nigra* subsp. *betulifolia***, clone 32 x 28, alleles shared with both clones	TQ 69269 74790 to TQ 69238 74796, about 18 coppiced trees on the top and south-facing side of the fort ruins (built by 1870, abandoned in 1950s and part demolished in 1960s), perhaps connected by suckering. Surveyed 9 July 2023 (SL).
Bedgebury Park	TQ7234	2010 (JP)	2023 survey; ***P. nigra* subsp. *betulifolia***, clone 28	TQ 72360 34406, by lake in old parkland, male tree, crown dying; surveyed on 13 August 2023 (SL). A second tree seen in 2012 now gone, apparently cut down.
Angley Wood	TQ73T (DS)	1956	[Not re-found when surveyed by SL, 2023.]	Ds has no recollection of this record, but the two areas where he spent most time then were Tucker's Pond and around the lake and he considers the latter is probably the most likely site.
Bearsted	TQ8055		2023 survey: ***P. nigra* subsp. *betulifolia* x *P. nigra* 'Italica'**	TQ 80452 55260, Bearsted Woodland Trust, a single large female tree in a field found by JPu in March 2023, recorded by SL on 18 June 2023. Perhaps planted by Walter Fremlin, landowner 1892-1925.
St. Mary Hoo	TQ8177		2023 survey; ***P. nigra* subsp. *betulifolia***, clone 28	TQ 81020 77370, stream or ditch line running downhill in dense scrub near former farmyard); large tree at edge of scrub, others appearing present but not accessible, male. Surveyed on 8 July 2023 (SL).
St. Mary Hoo	TQ8178	20 July 2006 (EGP). [Despite Philp (2010) being ostensibly limited to records 1990-2005, this seems to have been slipped in as well.]	2023 survey; ***P. nigra* subsp. *betulifolia*,** clone 28	TQ 81162 78121 to TQ 81194 78122, at least 22 trees either side of dry ditch at the edge of marshes below Coombe House, relatively short, perhaps once managed as coppice or suckers, no more than 18" in diameter except that one pollard was formerly a much larger tree, but trunk cut back. Surveyed on 8 July 2023 (SL); tested tree was male.
Broad Street	TQ8256	1981-1990	2023 survey; ***P. nigra* subsp. *betulifolia*,** clone 28	TQ 82606 56171, 19th C broadleaf plantation. Surveyed August 2023 (SL) when a collapsed multi-trunked tree found with only one trunk still alive.
Smarden	(a) TQ8739		2023 survey: ***P. x canadensis* *cv.* 'Serotina'**	TQ 87016 39889, male tree.
Smarden	(b) TQ8741	3 July 2015 (JP)	[Not surveyed, 2023]	Location not recalled by recorder and otherwise there is insufficient record detail to enable re-finding of tree.
Bethersden	TQ9140	21 July 1995 (PEG)	[Not re-found when surveyed by SL, 2023]	TQ 913 403, by stream. [Many large *P.* x *canadensis* trees found all along stream in Birch Wood when re-surveyed in 2023.]
Eastling	TQ9555	1983 (CT)	2023 survey; ***P. nigra* subsp.**	TQ 95961 55893, large old male tree

			betulifolia, clone 28	in corner of garden, former farmyard. Surveyed on 12 August 2023 (SL), when seen with four smaller trees planted in early 1980s with cuttings from the old tree after loss of others (there were two in 1983.).
Hothfield Lake	TQ9844	2000	2023 survey; ***P. nigra* subsp. *betulifolia***, clone 32	TQ 98060 44578, large female tree, by spring-line next to lake in old parkland. Surveyed on 6 August 2023 (SL), younger hybrid poplars on slopes above. Second tree recorded here before not seen.
Brookland	TQ9825	28 July 1995 (TR)	[Not re-found when surveyed by SB, 2023]	TQ 981 252, verge on S side of A259. [Most likely cut down, as dead stumps present when re-surveyed in 2023.]
Ashford Hospital	TR04B	1956	[Not re-found when surveyed by SL, 2023]	Site of the hospital now mostly converted to housing with no obvious poplar trees seen when re-surveyed in 2023.
Faversham	TR0062	2017	2023 survey: ***P. x canadensis cv. 'Serotina'***	TR 00288 62358, male tree
Brenzett	TR0127		2023 survey; ***P. nigra* subsp. *betulifolia***, clone 32	TR 01203 27343 and TR 01221 27354, female trees 18m apart, arable field edge alongside road, surveyed 5 August 2023 (SL).
Ivychurch	(a) TR0227		2023 survey; ***P. nigra* subsp. *betulifolia*,** clone 34	TR 02721 27719, two large roadside male trees in garden of St. Georges House (former rectory), surveyed 22 July 2023 (SL).).
Ivychurch	(b) TR0227		2023 survey; ***P. nigra* subsp. *betulifolia***, clone 32 x 34, sharing one allele with each parent.	TR 02989 27490, surveyed 5 August 2023 (SL), above ditch along scrubby edge of wheat field on east side of road. Sapling 6'-7' high. Clone 34 present in village (see previous entry), clone 32 near by (see next entry).
Ivychurch east	TR0327		2023 survey; ***P. nigra* subsp. *betulifolia***, clone 32	TR 03003 27457, large female tree on verge above ditch, west side of B2070, surveyed 22 July 2023 (SL).
Dymchurch	TR1029	Assumed same as recorded in Philp (2010) as *P. nigra* at TR12E, 7 June 1999	2023 survey**: *P. x canadensis***	TR 10380 29662
Sellindge Lees	TR1037	4 February 1994 (DH)	2023 survey; ***P. nigra* subsp. *betulifolia***, clone 32, both trees	TR 10389 37933 and TR 10437 37944, female trees, the first younger and healthier, the second a 10' stump of recently felled tree with almost all regrowth dead. Surveyed 16 July 2023 (SL), pond near former farmyard, currently in middle of housing estate green.
Saltwood Castle	TR13T	1959	[Not re-found when surveyed by SL, 2023]	The tetrad implies that the tree grew in the fields and/or the dismantled railway immediately north of the castle.
Littlebourne	TR2057	1 December 1993 (KR)	2023 survey; ***P. nigra* subsp. *betulifolia*,** clone 28	TR 20962 57223, large male tree, tallest in Kent, river bank and marsh, just below confluence of Nail Bourne and Silver Dyke. Surveyed 23 July 2023 (SL & SB).
Ash	TR2858 / TR2960	2000, 2017 / 2023	2023 survey: ***P. x canadensis***	TR 2919 6019. Surveyed 12 August 2023 (SL), when it was found that a former tree in the churchyard of St. Nicholas was represented by three saplings taken as cuttings from that tree and now growing in a garden tub in Cop Street. These provided the material for DNA testing.

There are two key results given in the table above: the genetic composition of plants from Ivychurch and Shornmead fort, which do not correspond to any known clone. Rather, each appears to carry genetic content from two different known clones, and to be the result of sexual reproduction, which is relatively rare for Black-poplars in Britain. These two occurrences, in effect native to Kent, provide the justification for inclusion of *Populus nigra* subsp. *betulifolia* in this rare plant register. All other trees in Kent are likely to have planted origins – at any rate, those which have been tested.

Sexual reproduction of Black-poplar is limited, first by the isolated nature of many recorded trees and secondly by a sexual imbalance in that there are many more males than females. The latter position obtains both nationally and in Kent: the 2023 survey found 17 Kent males and 10 females (there is probably selective pressure against planting females because of the perceived nuisance of drifts of seed fluff). Then there is the need for appropriate germination and growth conditions. These were described by Milne-Redhead (1990).[596] Where fertile seed is produced, it needs to fall on bare wet mud, soil or silt at the end of June, and the site has to remain bare and wet (but not flooded) until October when seedlings will be be 10-15cm high and roots will have penetrated about 30cm down, providing a degree of establishment which would help tolerate adverse conditions the following summer. Since lowland rivers have been increasingly managed and constrained, these conditions are less frequently found.

The **Ivychurch** plant, a sapling c. 2m high, was found along a scrubby roadside ditch which was cleared about eight years before survey, which presumably then provided the appropriate open wet conditions for germination and initial growth. One putative parent, a mature female clone 32, grew on the opposite side of the road and the other, a mature male clone 34, was located some 300m north west in Ivychurch village. It seems a matter of chance that these provided the pairing, given that *Populus* x *canadensis* and *P. nigra* 'Italica' were also in the vicinity. Clones 32 and 34 were known, when Cottrell *et al*. (2018) provided their summary of DNA analyses across Great Britain, to be widespread and the third and fifth most frequently encountered clones.

Shornmead fort.
Photo by Stephen Lemon,
9 July 2023

The **Shornmead** fort plant or plants – the 18 or so stunted trees on the fort ruins give the impression of being connected by suckering – have as putative parents clones 32 and 28, the latter being, according to Cottrell *et al.* (2018) the most widespread clone across Great Britain and likely to be what is called the Manchester Poplar. Planting looks very unlikely and the supposition is that it has established here between partial demolition of the fort in the 1960s and publication of its find in Philp (1982) (then described as a young sapling).

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[596] Milne-Redhead, E. (1990). The B.S.B.I. Black Poplar survey, 1973-88. *Watsonia* **18**: 1-5.

Its establishment has, however, some unexpected features. The first is the lack of potential parents in the immediate vicinity. Nevertheless, there is a 1957 record for *P. nigra* in Francis Rose's manuscript *Flora of Kent* at West Court Meadows, and West Court Farm (now a housing estate) was some 2.7km south-westwards of the fort, Westcourt Marshes (which may have been the Meadows) being slightly nearer. The terrain between is very open, and wind-borne seed could have been swept across without interruption until the fort walls. The second unexpected feature is the lack of correspondence between the ruins and the open wet ground normally required for seed germination. Lemon *et al.* (2024) suggest that the concrete and granite surface to which these trees are attached may be damper than first appears due to the presence of the old magazines directly below the fort which are flooded and so could serve as the colony's water supply by permeating through the ruins.

None of the other clonal analyses suggests any uniqueness of tested specimens in Kent or continuity with any historic occurrence in the county. The ten female trees of *P. nigra* subsp. *betulifolia* analysed all belonged to clone 32 (widespread but with most records in Surrey and Suffolk). The 17 male trees were mostly clone 28 (the commonest in Britain), with three belonging to clone 34 (widespread but recorded particularly in Cheshire), another to clone 23 (the second commonest in Britain) and another, at Norwood Country Park to clone 40 (a commercial cultivar introduced from Holland in 1950).

The table above shows that many records made earlier of *P. nigra* or *P. nigra* subsp. *betulifolia* have turned out to be misidentifications. This is unsurprising. Several trees were *Populus* x *canadensis*, which is usually separated on the basis of often having one or two small sessile glands on the leaf-blade near the top of the petiole; of having leaves which are more conspicuously toothed and sometimes subcordate at the base and which are minutely hairy at the margins when young; and not normally being burred on the trunk. Not all of these characters are consistent, however, *P.* x *canadensis* being very variable and having *P. nigra* in its ancestry. Several other trees were *P. nigra* subsp. *betulifolia* x *P. nigra* 'Italica', which may be called var. *plantierensis* or cv. 'Plantierensis' (the Plantières Elm)[597] and which is also difficult to separate, as the fastigiate nature of the Italica parent (Lombardy-poplar) is somewhat diluted.

This account has benefitted greatly from the researches of Stephen Lemon.

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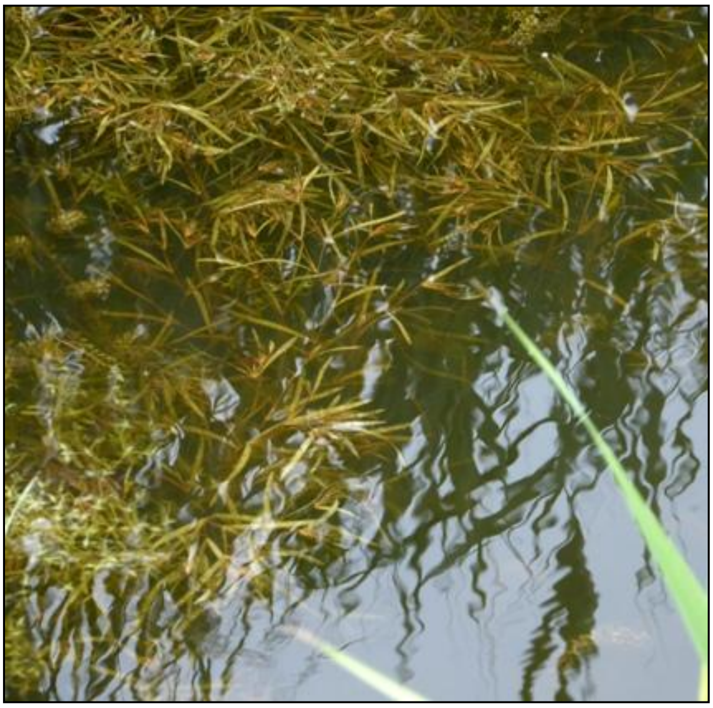
[597] This is Incorrectly given as Plantier's Elm in Stace, C.A. (2019). *New Flora of the British Isles* (it is named after a place, Plantières, the nurrsey of origin, rather than a person, Plantier). It would be better to treat the taxon as *P. nigra* Plantierensis Group to cater for its cultivated origin as having derived from more than one seedling.

Potamogeton acutifolius Link (Sharp-leaved Pondweed)

vc15; long extinct in vc16

Rarity / scarcity status

Potamogeton acutifolius is a very local pondweed, found scattered from Dorset to Norfolk, generally in clear ditches of moderately calcareous water, but seemingly in general decline. It is regarded as **Endangered** in both England and Great Britain as a whole with less than 2,500 plants left by 2014, and is nationally **rare**. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006, formerly a priority species for the UK's Biodiversity Action Plan, whose actions included maintaining traditionally managed grazing marsh systems in stronghold areas and monitoring for the prevention of eutrophication. In Kent, it is **rare** and as a Kent axiophyte it is indicative of good habitat.



Stodmarsh. Photo by Alex Lockton, 10 July 2018

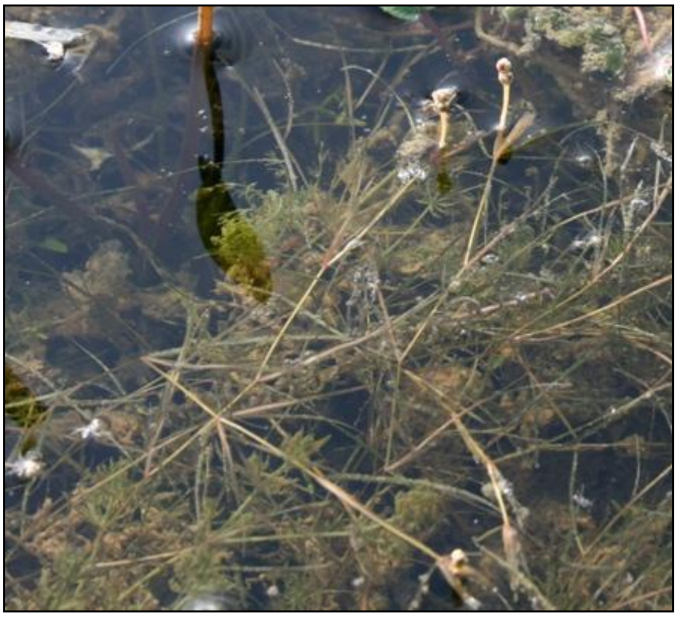
Account

The first record for Kent also appears to be the first for the British Isles. It is a specimen in the Natural History Museum determined by Dandy and Taylor from the herbarium of Adam Buddle (1662-1715) and collected at Deptford by Christopher Merrett, who died in 1695. Otherwise, there appear to be no early records other than the two cited in Hanbury & Marshall (1899): one from 'Withamdrew' (presumably Wickhambreaux) by George Dowker; and the other by Marshall himself from ditches between Appledore railway station and the village (1893). Hanbury and Marshall described its Kent status as very rare, in ditches and pools.

The Wickhambreaux area has remained suitable at least until the 1980s: Trudy Side found it in a fen dike at Preston Marshes in 1962, where it was confirmed by Francis Rose, and there is a subsequent record here, at Newnham Valley, in 1983. The marshes are an SSSI within the Lower Stour catchment, cited as a fen vegetation community with a combination of peaty soils and calcareous waters in the dikes providing a home for *Potamogeton acutifolius.* However, most sightings have not been in the Little Stour catchment, but relate to the nearby Stodmarsh NNR in the parallel Great Stour catchment, separated by a finger of high ground as both Stour rivers wend their way towards their confluence at Plucks Gutter. These latter sightings began with an unconfirmed report from a dike at Grove Ferry in 1950 (TR 240 264), and have continued to the present (2022). Many are by Alex Lockton, who considers the species to be not uncommon in the eastern half of the NNR, near to Grove Ferry, given that the present record set does not yet amount to a thorough survey.

Both the Preston/Newnham valleys and the Stodmarsh valley are low-lying (parts being at 2m above sea level) and represent former estuary from when the Stour rivers discharged into the Wantsum Channel, which divided the Isle of Thanet from mainland Kent. The Channel gradually silted up, particularly during the 12th and 13th centuries, and the estuarial lands were embanked and drained: the last boat to use the (by then, narrow) Channel did so in 1672. Alex Lockton points out[598] that

> 'the relevant fields of grassland are agriculturally unimproved and, as they have apparently never been ploughed or reseeded, they preserve some elements of the vegetation that arose when they were first drained and grazed. What is perhaps surprising is that this vegetation is characteristic of coastal grazing marshes, and has similarities with that in places like Graveney and Minster Marshes. These marshes are derived from earlier saltmarshes which were drained and isolated from the sea many years ago... a rare and invaluable remnant of an ancient, saline coastal grazing marsh of a quality possibly not equalled elsewhere in Britain'.



Stodmarsh, in flower. Photo by Alex Lockton, 11 June 2014

The Appledore area yielded specimens in 1935 and 1938 and a Kent Field Club meeting in 2015 was successful in finding it growing in a ditch here near the Royal Military Canal. However, the pondweed, infrequent though it is, has been found more widely in Romney Marsh, and its extent of occurrence should be regarded as continuing north eastwards to ditches at the Dowels, a low-lying peaty area (parts being at 1m above sea level) with much sheep pasture, not drained effectively until the 19th century and carrying a dense network of freshwater channels. The soils through which the *Potamogeton* ditches run appear to be those of the Dowels and Appledore series: thick acid peat overlain by loam and silty clay, originally calcareous but now slightly or deeply decalcified. As with Romney Marsh generally, it is reclaimed land (below the old sea cliffs which ring the lowlands from Appledore to Hythe), and in early Saxon times was probably saltmarsh.

The Dowels, habitat. Photo by Geoffrey Kitchener, 27 June 2012

There are, however, two further related locations for *Potamogeton acutifolius,* apparently unrecognised until the 1980s. Both are on the 'Upper Levels', reclaimed marshland criss-crossed by drainage channels associated with Romney Marsh, but further inland. One is at Smallhythe, which was a port when the River Rother flowed north of the Isle of Oxney, as a result of a diversion operative between c.1300 and the 1630s which led to the permanent inundation of the Upper Levels, including the area of what is now grazing marsh near Smallhythe bridge with its drainage channels where *Potamogeton acutifolius* has been recorded 1982-2020. The drainage system of the Rother Levels at this point probably reflects reclamation in the 17th and early 18th centuries. The second site is on that part of the Upper Levels which extends alongside the Newmill Channel running northwards from the Maytham area towards Tenterden. It also formed part of the 'drowned lands' of the Upper Levels in the early 17th century, probably with a similar history of reclamation, and has records 1985-2020. The soils here are alluvial, sandy loam/silt over peat.

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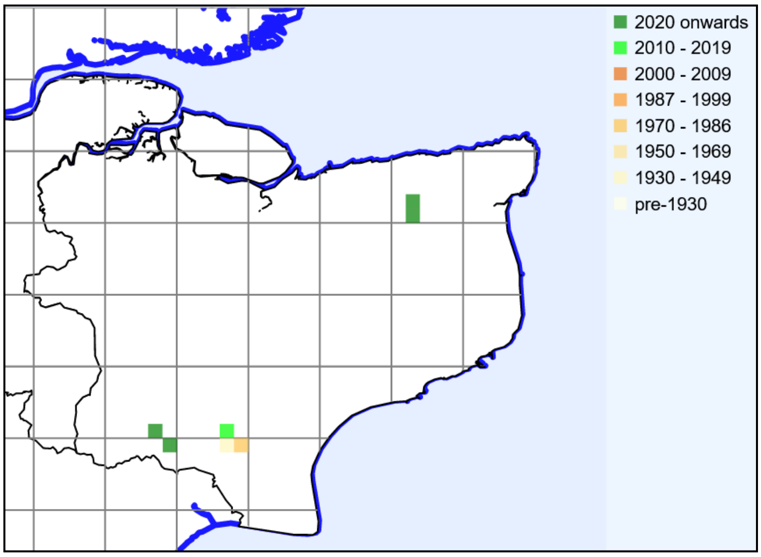
[598] Lockton, A. (2017). The Flora of Stodmarsh National Nature Reserve, https://bsbi.org/kent

The Dowels. Photo by Lliam, Roomey, 27 June 2012

Thus, the two Upper Levels sites, the Appledore/the Dowels sites, the locations at Stodmarsh and at Preston/Wickhambreaux all share origins of having been reclaimed from coastal or estuarial saltmarsh, or land otherwise flooded and subject to tidal influence. The drainage operations have left all with ditch systems, in parts of which *Potamogeton acutifolius* grows. While it is said[599] that the species grows in calcareous, mesotrophic or meso-eutrophic waters, only the north east Kent sites have a materially calcareous component to their drainage, although pH was measured at Stodmarsh at 7.5, viz. meso-eutrophic, slightly basic (Newbold, 2003).[600] Whether the presence of peat within the soil horizons of the lands through which the ditches run or salt content from previously brackish conditions are relevant factors appears unknown, but Newbold (2003) found conductivity of 700 microsiemens per cm in water sampled at Stodmarsh, which indicates a level of brackishness, and he suggested that the species may have adapted to two levels of conductivity in the British Isles, of which this is within the higher level. Conductivity readings were also taken by English Nature in 1996 in the survey mentioned below, and were consistent with good freshwater.



***Potamogeton acutifolius* Kent records to 2024 mapped at tetrad level, from BSBI database.**

It is regarded as most characteristically a species of shallow, species-rich drainage ditches on grazing marshes[601], acting as a pioneer when ditch management permits. It reproduces both by seeds and over-wintering turions. So far as Kent records are concerned, there is good evidence of habitat species-richness from an English Nature general survey in 1996 which sought to establish the botanical interest of the Stodmarsh National Nature Reserve, especially in comparing 79ha of land, formerly used as turf fields and newly acquired by English Nature, with the remainder of the NNR. The survey covered 169 ditches and found *Potamogeton acutifolius* in six of them. Ditch species-richness was assumed to be good at 10-14 species, exceptional at 15 or more. The *Potamogeton* ditches scored 14, 13, 17, 17, 15 and 16, an average of 15.3 species and so, exceptional. The plants found at those ditches included rare plant register species *Hydrocharis morsus-ranae* (Frogbit), *Myriophyllum verticillatum* (Whorled Water-milfoil) and *Oenanthe fistulosa* (Tubular Water-dropwort). A follow-up survey was undertaken in 2022, resulting in a large number of *Potamogeton acutifolius* records, included in the data table below. These included presence in the wider ditches, especially those that run north-south and are in full sunlight. Some of these contained huge quantities of *Potamogeton acutifolius* and *Utricularia vulgaris* (Greater Bladderwort) . In 2022 the *Potamogeton* was in 18 (10%) of 182 ditches, which at first glance seems like a clear increase over 1996; but the samples were neither random nor systematic. However, it has clearly spread into areas that were previously dry.

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[599] Preston, C.D. (1999). *Potamogeton acutifolius* Link (Potamogetonaceae). In Wiggington, M.J. (ed.) *British Red Data Books 1 Vascular plants.* Joint Nature Conservation Committee, Peterborough.

[600] Newbold, C. (2003). The ecology and status of *Potamogeton acutifolius*, Link. [sic] (Sharp-leaved pondweed) in 2003. With reference to the BSBI records for the period 1970 to 1999. *Report to English Nature*.

[601] Preston, C.D. (1995). *Pondweeds of Great Britain and Ireland*. Botanical Society of the British Isles, London.

We also have a species listing for a 2003 Stodmarsh record, which included *Ceratophyllum demersum* (Rigid Hornwort)*, Hydrocharis morsus-ranae* (Frogbit)*, Lemna minor* (Common Duckweed)*, Potamogeton pusillus* (Lesser Pondweed), and *Utricularia vulgaris* (Greater Bladderwort). Newbold (2003) points out that some associates, such as *Lemna trisulca* (Ivy-leaved Duckweed), *Hydrocharis morsus-ranae* and *Spirodela polyrhiza* (Greater Duckweed) may, if they become too dominant, suppress *Potamogeton acutifolius.* The pondweed has been found in Kent where ditches have recently been cleared and in one case it had not been seen there in a survey before such clearance. Newbold (2003) suggests that there is intolerance of competition and it is most abundant around the third and fourth years after ditch management. It would be interesting to have known when management last took place in relation to the ditch recorded at Smallhythe in 1991, where *Potamogeton acutifolius* was the dominant species.

A consequence of this competition intolerance is that records may be discontinuous, even if there were regular surveying. A survey in 2003 (Newbold, 2003) investigating known Kent sites failed to find the plant at any of them (but found one new site, at Stodmarsh). At Stodmarsh, the possibilities for a site with 1974 and 1998 records were overgrown ditches, either with *Sparganium erectum* (Branched Bur-reed) or with *Hydrocharis morsus-ranae.* (However, it has since been found in other sites at Stodmarsh.) At the Newnham valley 1983 site, the ditch was found not to have been managed for 10 to 15 years and was overgrown with dominant *Sparganium erectum* growing into the channel, and with dominant *Phragmites australis* (Common Reed) along the outer edge; *Potamogeton natans* (Broad-leaved Pondweed) covered 99% of the water. At the Dowels 1982 site, an apparently suitable stretch of ditch produced no sightings; vegetation management appeared to have been carried out within perhaps three years, but the water level had recently been artificially raised by 0.5m. (Plants were found in the same ditch system in 2012.) At the Smallhythe 1982 site, vegetation appeared suitably diverse and left 75% of the water surface open, but there was shading along the relevant ditch by *Phragmites australis* and the water appeared iron ochre stained[602]. At the nearby Smallhythe 1991 site, the ditch edge was 75% dominated by *Phragmites australis,* with consequent partial shading; for the remainder, *Glyceria maxima* (Reed Sweet-grass) was recorded. So the issues here may have been shading and, perhaps, water-staining again. (The pondweed has been seen at Smallhythe since, in 2008 and 2020.)

Lansdown (2021)[603] describes it as typically occurring ‘as a series of dynamic metapopulations, usually involving a large number of wetlands (either discrete water bodies or connected wetland complexes) within which populations develop, flower, then decline as habitat suitability varies in response to scour, vegetation succession and management. Dispersal between wetland complexes appears to be rare, such that colonisation of new areas or re-colonisation of historic sites is slow’. The Preston Marshes/Newnham Valley records from the 1960s to the 1980s could be regarded as an element of the Stodmarsh metapopulation which may have died out. Threats faced by *Potamogeton acutifolius* nationally are:

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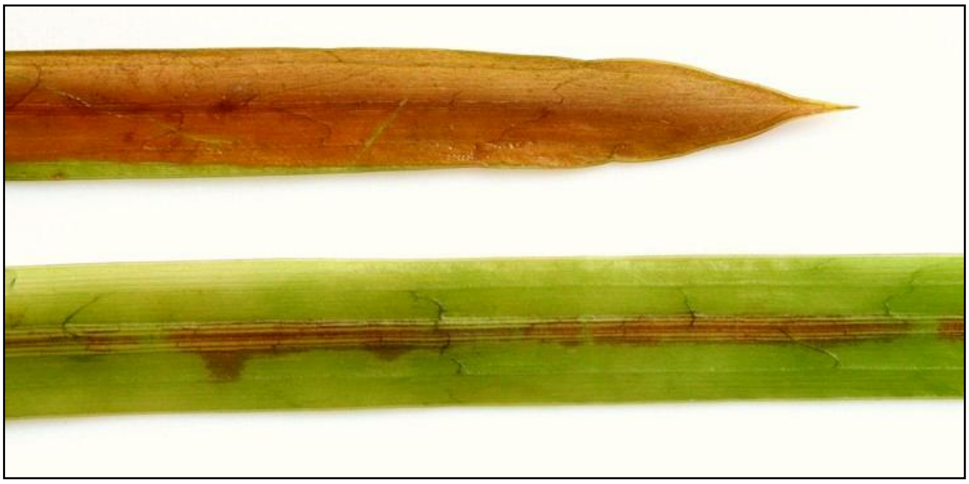
[602] However, iron-stained water from the Lower Greensand appears to be no impediment to the growth of *Potamogeton acutifolius* at Amberley Wild Brooks (ed. Abraham, F. (2018), *Flora of Sussex*, Sussex Botanical Recording Society).

[603] Lansdown, R.V. (2021). An ecological profile of Sharp-leaved Pondweed (*Potamogeton acutifolius*). Natural England (draft) Report.

- habitat stability leading to vegetation succession and closure of areas of open water;
- anthropogenic nutrient enrichment, possibly specifically the secondary effects such as increased competition and growth of filamentous algae;
- increased turbidity, which may be linked to nutrient enrichment, but may also occur due to other factors.

Potamogeton acutifolius is a slender, fully submerged (except for flowers/fruit) pondweed with flattened zig-zag stems. The leaves are grass-like, 1.5–5mm wide (mostly over 2mm), dark green but often tinged reddish-brown, 3-veined (including an obvious mid-rib) with finer strands between them; the stipules are free from, and do not sheath, the leaf base. Identification is usually keyed out against *Potamogeton compressus* (Grass-wrack Pondweed), which is not a Kent plant and has 5-veined leaves.



Leaves showing tip and midrib with flanking veins, from The Dowels. Photo by Lliam, Roomey, 28 June 2012

Site	Grid reference	Site status	Last record date	Recorder	Comments
Friezingham, Rolvenden Layne	TQ8630 & TQ8631		(1) 6 September 2020 (2) 7 August 2003 (3) 25 August 1985	(1) SB & RL (2)(a) KF (b) KF, FB, NC (3) JP	(1) At TQ 86870 31321, in a ditch running alongside railway line from TQ 86885 31950 (2) (a) TQ 8680 3139, watercourse, Friezingham dikes. (b) TQ 869 305; Crayfish Farm, Friezingham Dikes & Newmill Channel. (2) TQ 869 311, near Newmill Channel, Crayfish Farm, ditch on west of railway opposite end of Gazedown Wood.
Smallhythe	TQ8929		(1) 6 September 2020 (2) 15 August 2008 (3) 2 August 2008 (4) 15 August 2000 (5) 1991 (6) 6 August 1982	(1) SB, RL (2) JW, JP (3) BB (4) EGP & PH (5) BB (6) JOM	(1) TQ 89250 29518, TQ 89274 29402 and TQ 89276 29390, altogether no more than ten plants but abundant turions as well as some ripe seed. (2) TQ 890 295, grazing marsh ditches. (3) In grazing marshes drainage ditch. (4) Recorded as TQ82Z, and assumed to be this monad. (5) TQ 894 298, dominant species in dike.

					(6) TQ 891 296, ditch south of B2082, SW of Smallhythe Bridge, Romney Marsh Ditch Plants Survey.
Appledore	TQ9630	SSSI	16 July 2015	KBRG meeting	TQ 96723 30251, in good quantity in ditch.
Appledore (station)	TQ9829		1982	EGP	TQ 981 295, dike south of road, near Appledore Station [this gridref does not quite match the description].
The Dowels	TQ9730 & TQ9731	SSSI	(1) 16 July 2015 (2) 30 September 2012 (3) 27 June 2012 (4) 13 May 2004 (5) c. 2002 (6) 2001 (7) 2 July 1982	(1)KBRG meeting (2) OL & BS (3) KBRG meeting (4) EGP (5) BB (6) BB (7) EGP	(1) TQ 97248 30498, in good quantity in ditch. (2) TQ 979 312. (3) In ditches at the Dowels, west of road, including at TQ 9792 3128 several plants in fairly open deepish water, *Stuckenia pectinata (Potamogeton. pectinatus)* also present, TQ 9781 3114, TQ 9778 3118. (4) Given as TQ93Q and assumed to be TQ9730 or TQ9731. (5) TQ 9774 3113, appeared in recently cleared ditch. (6) TQ 9771 3111, scattered plants in ditch. (7) TQ 978 312. {EN gridreference is c. TQ 975 307.]
Stodmarsh	TR2261	SSSI, National Nature Reserve	(1) 25 August 2023 (2) 19 September 2022 (3) 10 September 2022 (4) 2 September 2022 (5) 11 July 2022 (6) 6 July 2022 (7) 5 July 2022 (8) 4 July 2022 (9) 1 July 2022 (10) 20 August 2021 (11) 12 August 2021 (12) 11 August 2016 (13) 1996	(1) AL & JM (2) AL (3) AL & JM (4) AL & BH (5) PW, PG-S & HS (6) VB-H, KF-S & KO (7) AL, HSt & KC (8) AL & KC (9) AL & KC (10) AL (11) AL (12) AL, LR (13) PW, BB, VE	(1) TR 2256 6153. Reedbed ditch. (2) ditch survey - TR 2264 6173, TR 2269 6163 in reedbed ditch, TR 2270 6152 in reedbed ditch, TR 2275 6152 where very abundant and possibly more than any other ditch, TR 2279 6158, TR 2281 6150. (3) ditch survey - TR 2252 6157 in reedbed ditch, TR 2250 6167, TR 2243 6162 in reedbed ditch, TR 2219 6181 in reedbed ditch, TR 2237 6158, TR 2245 6154 where abundant and fruiting. (4) ditch survey - TR 2262 6167, TR 2260 6174 in reedbed ditch, TR 2244 6138, ditch survey. (5) TR 2294 6156, ditch survey. (6) TR 2315 6244, Stodmarsh, ditch survey. (7) TR 2286 6199, ditch survey. (8) TR 2264 6207, ditch survey. (9) TR 2289 6196, TR 2295 6199 in ditch with grazed margin, ditch survey. (10) Cattle grazed ditch, with *Azolla* apparently absent. (11) TR 2286 6199, ditch with grazed margin. (12) TR 2234 6194 and TR 2226 6189, ditches. (13) TR 225 619 ditch 38.
Stodmarsh NNR	TR2262	SSSI, National Nature Reserve	(1) 16 June 2024 (2) 30 August 2022 (3) 9 August 2022 (4) 9 July 2022 (5) 5 July 2022 (6) 5 July 2022 (7) 4 July 2022 (8) 4 July 2022 (9) 24 June 2022 (10) 20 June 2022 (11) 9 September 2021 (12) 19 August 2021	(1) AL (2) AL, BH & KO (3) AL & KO (4) PW (5) AL, HSt & KC (6) PW, KF-S & PG-S (7) AL & KC (8) AL, PW & KC (9) AL, HSt & KC (10) AL & RH (11) -(15) AL	(1) TR 2292 6213. Numerous plants along a recently-cleared ditch. (2) ditch survey - TR 2288 6223, TR 2281 6257, TR 2296 6261. (3) TR 2248 6206, ditch survey. (4) TR 2255 6215, ditch survey. (5) ditch survey - TR 2293 6206, TR 2278 6220, TR 2283 6214 in meadow ditch, TR 2284 6206, TR 2284 6220, TR 2286 6199, TR 2290 6212, ditch survey. (6) TR 2294 6218, ditch survey. (7) TR 2272 6216, TR 2265 6217, TR

			(13) 12 August 2021 (14) 8 August 2021 (15) 30 June 2021 (16) 1996	(16) PW, BB, VE	2273 6010 in meadow ditch, TR 2274 6201, ditch survey. (8) TR 2259 6223, TR 2245 6216, ditch survey. (9) TR 2298 6211, Stodmarsh ditch survey. (10) TR 2293 6206, TR 2298 6203, Stodmarsh ditch survey. (11) TR 2278 6220; TR 2278 6220; TR 2283 6214, (12) TR 2274 6201. (13) TR 2284 6206; TR 2274 6209, ditch with grazed margins. (14) TR 2293 6206, fairly recently cleared ditch with cattle grazed margins. (15) TR 2299 6210, ditch cleared last year leaving a wide marshy portion (16) TR 229 621 ditch 67; TR 226 620 ditch 44; TR 228 620 ditch 56; TR 229 620 ditch 65.
.Preston Marshes	TR2360	SSSI	7 June 1983	GP & RJK	TR 231 602, Newnham Valley, determined by EGP.
Stodmarsh	TR2361	SSSI, part National Nature Reserve	(1) 11 July 2022 (2) 11 July 2022 (3) August 2003	(1) PW, PG-S & HS (2) AL, RH & BH (3) CN	(1) TR 2294 6156, ditch survey. (2) Stodmarsh ditch survey - TR 2321 6176 where abundant, TR 2316 6186 where quite abundant throughout. (3) TR 23104 61958, occasional in ditch 5m wide (so not overshaded by emergent vegetation), 1.2m deep, perhaps 2 years after ditch management. Cattle-grazed marsh. Associated species: frequent growths of *Ceratophyllum demersum, Hydrocharis morsus-ranae, Lemna minor, Potamogeton pusillus, Utricularia vulgaris*. Margins diverse, with occasional *Alisma plantago-aquatica, Sparganium erectum, Rorippa amphibia, Myosotis scorpioides, Rumex hydrolapathum*.
Stodmarsh	TR2362	SSSI, National Nature Reserve	(1) 8 June 2023 (2) 7 July 2022 (3) 6 July 2022 (4) 5 July 2022 (5) 5 July 2022 (6) 5 July 2022 (7) 5 July 2022 (8) 22 August 2021 (9) 17 August 2021 (10) 9 July 2018 (11) 7 July 2018 (12) 31 August 2016 (13) 7 July 2016 (14) 31 July 2015 (15) 7 July 2015 (16) 11 June 2015 (17) 26 June 2014 (18) 30 May 2014 (19) 18 May 2014 (20) 1998 (21) 1996 (22) 3 July 1974	(1) AL (2) VB-H, KF-S & KO (3) VB-H, KF-S & KO (4) PW, KF-S & PG-S (5) VB-H, EW & JCo (6) AL, HSt & KC (7) VB-H & EW (8) AL (9) AL, JM (10) AL (11) AL, RB (12) AL, JM (13) AL, JM (14) AL, JM (15) AL, JM (16) AL, JM (17) AL, JM (18) AL, JM (19) KFC meeting (20) PW (21) PW, BB, VE (22) EGP	(1) TR 2301 6207. (2) TR 2356 6279, TR 2343 6287, Stodmarsh ditch survey. (3) TR 2315 6244, TR 2308 6224, TR 2320 6241, Stodmarsh, ditch survey. (4) TR 2310 6242, TR 2303 6224, TR 2308 6211, Stodmarsh ditch survey. (5) TR 2328 6212. TR 2335 6208, TR 2337 6229, TR 2351 6210, Stodmarsh ditch survey. (6) TR 2308 6212, Stodmarsh ditch survey. (7) TR 2314 6220, Stodmarsh ditch survey. (8) TR 2343 6287. (9) TR 2328 6212, abundant all along this stretch and TR 2324 6238, blunt-leaved variety. (10) TR 2344 6291, abundant in a ditch by the path. (11) (a) TR 2340 6276, in the ditch in front of the dipping platform. (b) TR 2328 6291, ditch 114. (12) TR 2316 6244, ditch 90. (13)(a) TR 2324 6233, ditch 99.

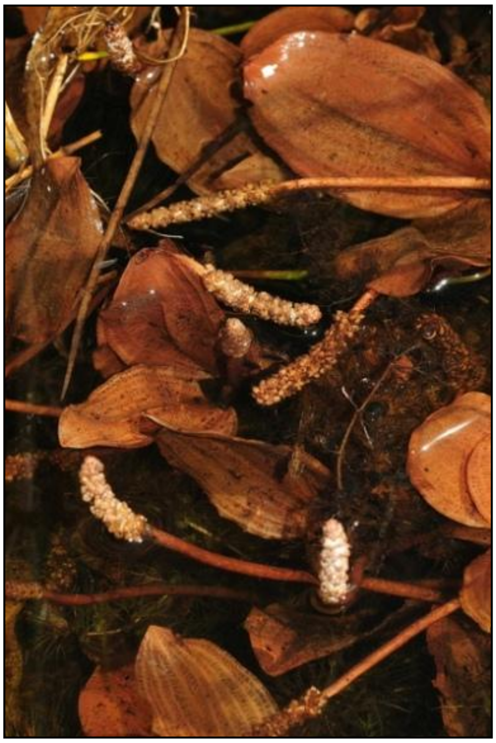
					(b) TR 2343 6229, a few clumps in Harrison’s Drove pond. (14) TR 2342 6227, ditch 117, in front of Harrison's Drove Hide. (15) TR 2326 6235, in a recently dredged ditch. (16) TR 2329 6221, a few plants in a recently dredged ditch. (17) TR 2343 6229, fruiting. (18) TR 2343 6229, occasional in lake in front of Harrison’s Drove hide, with two other pondweed species, conf. CP. (19) Ditch at c. TR 234 623. (20) TR 230 620, recorded in a ditch where not previously recorded by 1996 survey following ditch clearance. (21) TR 231 623. (22) TR 230 620, det. Dandy & Taylor.
Stodmarsh	TR26F		After 1970, before 1981	Philp (1982)	Most likely to be TR2261 or TR2361.
Stodmarsh	TR26G		After 1970, before 1981	Philp (1982)	Most likely to be TR2262 or TR2362, linking up with the TQ26F record.

Potamogeton coloratus Hornem. (Fen Pondweed)

vc15

Rarity / scarcity status

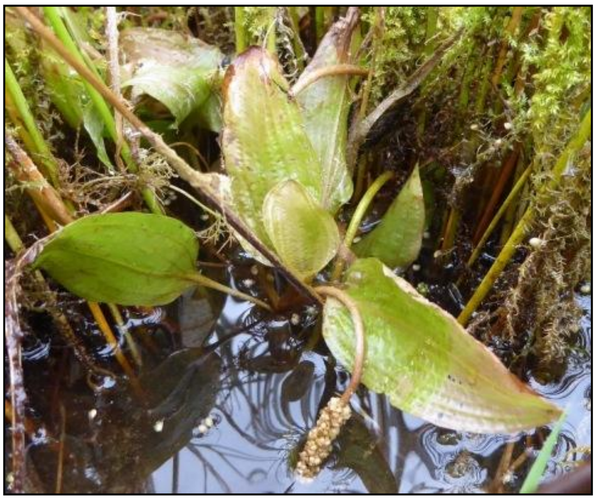
Potamogeton coloratus is a pondweed of base-rich peaty waters, local throughout much of the British Isles and treated as **nationally scarce**, although its threat status in both England and Great Britain as a whole is assessed as of 'Least Concern'. In Kent, it is limited to a small area in the north east of the county and is **rare**. It is a Kent axiophyte and so is indicative of good habitat.



Worth Minnis. Photo by Lliam Rooney, 5 July 2011

Account

The first Kent record for Fen Pondweed is a specimen gathered by W.W. Saunders in 1837 from Ham Ponds, and held in **BM**. It was published by Charles Babington as an aside in his paper On the Botany of the Channel Islands (*Annals of Natural History*, 1838, **2**: 348-350), in which he mentioned 'Mr. W. Wilson Sanders [sic] informs me that he has gathered it in ditches at Ham Ponds, near Sandwich, Kent.'. Hanbury & Marshall (1899), who regarded the species as a very rare plant of peaty ditches and pools, could only otherwise cite specimens collected by Charles Dowker at Preston Court Marshes and Hothfield bogs (they did not mention that both of them, F.J. Hanbury and E.S. Marshall, had also collected from Ham Ponds). The claimed Hothfield record is improbable in view of the acidity of the bogs: Francis Rose thought it an error[604], and Eric Philp omitted it from his listing of Hothfield plants[605], recognising only *Potamogeton polygonifolius* (Bog Pondweed) there.



Stodmarsh. Photo by Alex Lockton, 13 August 2016

Ham Ponds have long ceased to be open water and the site is now Ham Fen KWT reserve, from which Francis Rose knew the pondweed 1949-60, although it could not be found in 1991 or 1996. There are further remnants of fen in this area, including at Hacklinge and Worth Minnis where calcareous waters flow through ditches on modified peaty ground. Francis Rose recorded the pondweed from fen ditches at Hacklinge from 1946, giving it as abundant in ditches, as also was *Hydrocharis morsus-ranae* (Frogbit) and *Elodea canadensis* (Canadian Waterweed); in addition he noted it from Worth Minnis 1946-60[606]. Works by the RSPB in 2019-20 establishing a bird scape and modifying ditches at Worth Minnis resulted in an abundance of the pondweed in 2021. It is quite possible that this large quantity reflects germination in 2020 from the seedbank,

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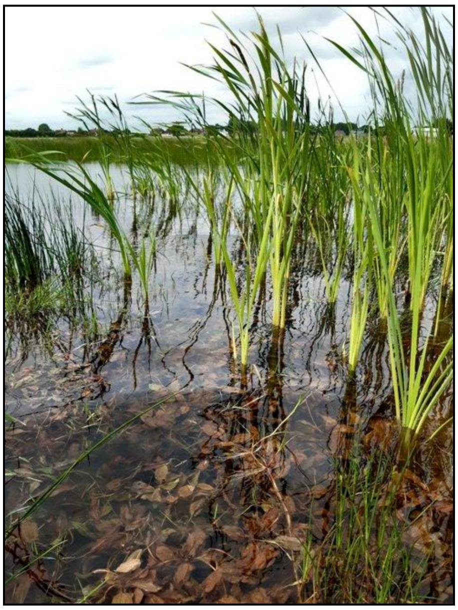
[604] In his MS Flora.

[605] Philp, E.G. (1975). The Biology of the Reserve. *The Transactions of the Kent Field Club* (A Symposium on Hothfield Local Nature Reserve), **5**:108-121.

[606] Rose, F. (1950). The East Kent Fens, *Journal of Ecology* **38**: 292-302.

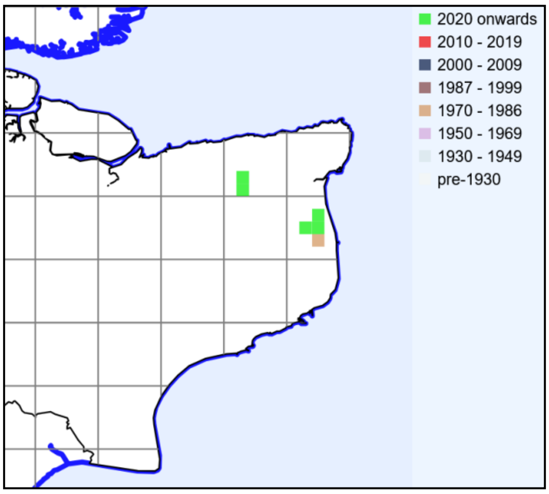
Potamogeton coloratus seeds being known to retain viability for upwards of 30 years.[607] The total range of this species within what is a fairly local area around Hacklinge/ Worth amounts, since 1970, to nine monads and the difference between recording by way of sampling accessible areas and recording by intensive survey is shown by data from 1982 and 2003 surveys, which located the species in 9 and 29 ditches respectively.

Worth Minnis, bird scrape. Photo by Stephen Lemon, 22 June 2022

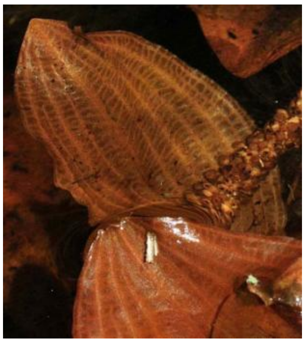


The other historic location, Preston Court Marshes, is presumably the residual fens of the Newnham Valley through which runs the Little Stour, and *Potamogeton coloratus* was refound here in 1997. This appears to be about 2km downstream of Wingham Fen, north west of Wingham village, where Francis Rose knew it from 1945. He described Wingham Fen as having a small relic of old fen immediately to the south east of Little Britton Farm, but otherwise, to the north of the farm, cultivated as well-drained pasture or arable, the latter showing a dark, peaty soil but having ditches with a flora highly reminiscent of that at Worth Minnis, including *Potamogeton coloratus.* This area is the valley of the Wingham River, fed by calcareous springs, and joining the Little Stour just before Newnham Valley; it lacks recent records.

***Potamogeton col*oratus Kent records to 2024 mapped at tetrad level, from BSBI database.**



A third location for *Potamogeton coloratus* was discovered by Alex Lockton in 2016, in Stodmarsh National Nature Reserve, some 2km distant from the Newnham Valley, but in a different river catchment, that of the Great Stour. Here it was present as a sizeable patch in National Vegetation Classification community S19 (*Eleocharis palustris* swamp). Quadrat recording data are included in Lockton (2017)[608], and this quadrat is described as 'the best example I have found of this community. Note the presence of brackish plants such as *Carex divisa* and the rarity *Potamogeton coloratus*'. The full quadrat listing (with DAFOR values) is: *Eleocharis palustris* (Common Spike-rush) 10; *Agrostis stolonifera* (Creeping Bent) 3; *Juncus articulatus* (Jointed Rush) 7; *Chara vulgaris* (Common Stonewort) 4; *Juncus inflexus* (Hard Rush) 4; *Galium palustre* (Marsh-bedstraw) 3; *Baldellia ranunculoides* (Lesser Water-plantain) 4; *Carex divisa* (Divided Sedge) 6; *Potamogeton coloratus* (Fen Pondweed) 4; *Ranunculus sardous* (Hairy Buttercup) 2; *Rumex conglomeratus* (Clustered Dock) 1; *Carex hirta* (Hairy Sedge) 2; *Carex otrubae* (False Fox-sedge) 1. The presence of rare plant register species *Baldellia ranunculoides* in this list (although not generally characteristic of S19) is also an indicator of the quality of this location's flora.



Worth Minnis, leaves with netted cross-veins. Photo by Lliam Rooney, 5 July 2011

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[607] Kaplan, Z., Šumberová, K., Formanová, I. & Ducháček, M. (2014). Re-establishment of an extinct population of the endangered aquatic plant *Potamogeton coloratus*. *Aquatic Botany* **119**: 91–99.

[608] Lockton, A. (2017). The Flora of Stodmarsh National Nature Reserve, https://bsbi.org/kent

Our overall 2010-23 records cover five tetrads (six monads).

Potamogeton coloratus has broad leaves which may be floating or submerged; there is little, if any, difference between the two types, and the upper ones may in any event lie slightly under water. The leaves are thin and translucent, often a reddish-brown, and the secondary cross-veins give the leaves a very characteristic netted appearance.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Newnham Valley	TR2360		20 September 1997	(1)	[May be TR 2321 6014, gridref from record with no other details except date.]
Preston north west	TR2361	SSSI	(1) 11 July 2022 (2) 11 July 2022	(1) AL, RH & BH (2) AL & BH	(1) TR 2322 6190, Stodmarsh ditch survey. (2) TR 2333 6182, TR 2317 6193, Stodmarsh ditch survey.
Stodmarsh	TR2362	SSSI, National Nature Reserve	(1) 8 July 2022 (2) 13 August 2016	(1) AL, PW & KF-S (2) AL	(1) TR 2395 6242, Stodmarsh. Completely dried up this year only desiccated leaves visible. (2) TR 2395 6242, in S19 *Eleocharis palustris* swamp.
Ham Fen	TR3354	SSSI, part KWT reserve	(1) 17 June 2018 (2) 13 July 2013 (3) 26 August2006 (4) 2 March 1983	(1) SL (2) KFC meeting (3) KF (4) ACH	(1) Hacklinge, west side of A258 (Ham Fen KWT), flooded ditch (Unit 53: Ham Fen Fields), TR 33846 54488 to TR 3376 5442. (2) Common in all shallow ponds. (3) TR 3350 5485, Ham Fen in 5-year old pond. (4) TR 339 543, TR 334 549..
Ham Fen	TR3355	SSSI, KWT reserve	(1) 28 July 2024 (2) 13 June 2024 (3) 19 July 2017 (4) 1 August 2012 (5) 2003 (6) 5 August 2001 (7) 5 August2002	(1) AL & TS (2) AL & CA (3) SB, SL (4) SB (5) CEC (6) RM (7) JP	(1) TR 3316 5517. Wettest past of the field. Ham Fen. (2) TR 330 552, Ham Fen. (3) Ham Fen. Well grown plants in shallow water with *Chara* spp. at TR 3308 5522. Also widespread small terrestrial plants abundant on mud within the surrounding area of wet peaty mire. (4) Ditch at Ham Fen TR 3317 5505. (5) (a) TR 33227 55246, ditch 280, (b) TR 33970 55620, ditch 173, Hacklinge Ditch Survey. (6) & (7) TR3355.
Ham Fen area	TR35H		29 June 2002	EGP	
Lydden Valley	TR3453	SSSI	(1) 2 March 2003 (2) 1982	(1) ACH (2) ACH	(1) TR 344 535. (2) NE of Northbourne. TR 34241 53615, ditch 192
Hacklinge area	TR35M		23 June 2002	EGP	[May be TQ TR3454, see 1976 record.]
Hacklinge	TR3454	SSSI	(1) 6 April 1993 (2) 24 July 1991 (3) 2 March 1983 (4) 1982 (5) 8 August 1976	(1) PMH (2) FR (3) ACH (4 ACH (5) EGP	(1) Det. CDP. (2) TR3454 (3) TR 347 546. (4) (a) TR 34320 54050, ditch 241, (b) TR 34543 54977, ditch 364. (5) TR 342 543.
Worth Minnis	TR3455	SSSI	(1) 12 August 2023 (2) 22 June 2021 (3) 10 July 2020 (4) 5 July 2011 (5) 2003 (6) 2 March 1983 (7) 1982	(1) KFC meeting (2) SB & SL (3) SB & RL (4) KBRG meeting (5) CEC	(1) RSPB Lydden, TR3455. (2) RSPB Lydden Valley Reserve Compartment 37. In a shallow well-cleared ditch at TR 34508 55637. (3) A patch of plants seen in the usual ditch at T R34286 5576. Very little space remains clear of *Juncus*

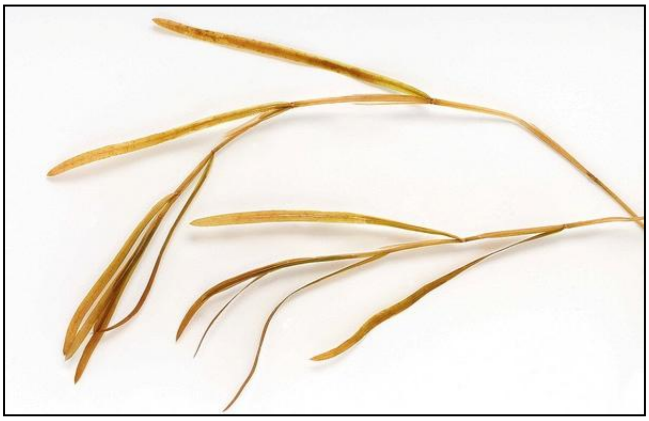
				(6) ACH (7) ACH	*subnodulosus* with no cattle grazing this year. (4) (a) A patch of plants seen in the usual ditch at TR 34286 55762 . Very little space remains clear of *Juncus subnodulosus* with no cattle grazing this year.patch of c. 1 square metre in shallow ditch in grazing meadow at TR 34244 55819. (b) small patch in shallow ditch in grazing meadow TR 34241 55826. (5) (a) TR 34398 55419, ditch 159, (b) TR 34430 55230 , ditch 162, (c) TR 34472 55879, ditch 130, (d) TR 34175 55790, ditch 128, (e) TR 347675 5784, ditch 140, (f) TR 34856 55397, ditch 155.. Hacklinge Ditch Survey. (6) TR3455. (7) (a) TR 34130 55940, ditch 394, (b) TR 34398 55419, ditch 346, (c) TR 34466 55514, ditch 345, (d) TR 34650 55020, ditch 323, (e) TR 34259 55574, ditch 329, (f) TR 34300 55680, ditch 343, (g) TR 34538 55598, ditch 349, (h) TR 34577 55882, ditch 351, (i) TR 34856 55397, ditch 333, (j) TR 35723 55158, ditch 413, (k) TR 34335 55968, ditch 364, (l) TR 34340 55441, ditch 338, (m) TR 34615 55857, ditch 357, (n) TR 34620 55652, ditch 355, (o) TR 34256 55285, ditch 326, (p) TR 34472 55879, ditch 363, (q) TR 34790 55180, ditch 322, (r) TR 34795 55593, ditch 356.
Worth Minnis	TR3456	SSSI, RSPB Reserve	(1) 12 August 2023 (2) 22 June 2021 (3) 1982	(1) KFC meeting (2) SB & SL (3) ACH	(1) RSPB Lydden TE3456. (2) (a) RSPB Lydden Valley Reserve Compartment 46 Great Wood. At TR34406 56041 and at TR34373 56043 in a channel cut 2019-20 within the wood. (b) RSPB Lydden Valley Reserve Compartment 44. In profusion west of Great Wood in shallow pool at TR 3425 5601 and at TR 3420 5606, in peaty pools that were created in 2019-20 and also at TR 3425 5622 in an older pool in a peaty grazing meadow on the northern side of Great Wood. (3) Near Temptye (a) TR 34231 56047, ditch 393, (b) TR 34646 56011, ditch 358, (c) TR 34655 56120, ditch 359, (d) TR 34241 56125, ditch 365, (e) TR 34514 56007, ditch 362, (f) TR 34749 56016, ditch 370.
Betteshanger	TR3553		1982	ACH	Near Cottington Court Farm
Lydden Valley	TQ35N		5 September2006	JC	
Lydden Valley	TR3555	SSSI	(1) 2003 (2) 1982	(1) CEC (2) ACH	(1) TR 35004 55590, ditch 164. (2) TR 35072 55290, ditch 317.
Cottingham Lakes	TR3653	SSSI	1982	ACH	TR 36017 53190, ditch 522 [given as Lydden Valley, but appears to be a ditch by Cottingham Lakes].

Potamogeton friesii Rupr. (Flat-stalked Pondweed)

vc15; gone from vc16

Rarity / scarcity status

Potamogeton friesii is a pondweed with a scattered distribution in the British Isles, local and formerly treated as (just) nationally scarce (but no longer so), with concentrations in the East Midlands and Norfolk. In Great Britain as a whole it is considered to be **Near Threatened**. In England, a comparison of the species' area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 48% in the likelihood of its being recorded, and it is regarded as **Vulnerabl**e to the risk of extinction. In Kent, it is restricted to the north east of the county and, having regard to the records in Philp (2010), is **scarce**, although subsequent recording suggests that it is a little more frequent than this. It is a Kent axiophyte and so is indicative of good habitat.



Stodmarsh. Photo by Lliam Rooney, 20 May 2014

Account

The first county record is in Milne & Gordon's Indigenous Botany (1793) as *Potamogeton compressum*: 'Pondweed with a flat stalk grows plentifully…in the river Cray'. Hanbury & Marshall (1899) regarded it as rather rare in ponds, streams and ditches. They cited records from West Kent, which do not amount to a distribution with any pattern: a find by Marshall in a pond east of Marden, and another in 1866 near Dartford by F.A. Hanbury, a relative of his co-author. Both of these seem questionable, and the Dartford record was re-determined by Dandy and Taylor as *Potamogeton obtusifolius* (Blunt-leaved Pondweed)[609]. Not mentioned by the *Flora of Kent* authors was an 1840 specimen gathered by Dr John W. Curtis at Anerley, now in **BM**. Apart from these records, and mention in Francis Rose's MS Flora of a find by G.M. Brown in 1963 of the pondweed in a tributary of the Cray near Bexley, which echoes the much earlier Milne & Gordon record, there are no West Kent records, and it is presumed gone from vc16.

Stodmarsh. Photo by
Lliam Rooney, 18 May 2014

More secure, however, is the pondweed's occurrence in north east Kent, where it has long been known as a species of calcareous fen-dikes, with Hanbury & Marshall (1899) mentioning Monkton Marsh, Minster Marsh, Pegwell Bay and Ramsgate, plus a reference to 'Between Pegwell Bay and Reculvers [sic], sparingly', which is an extract, rephrased, from a list of marsh plants from ditches of the 'flats' or levels originally occupied by the Wantsum Channel, with the broad estuary of the Stour, formerly separating the Isle of Thanet from the mainland.

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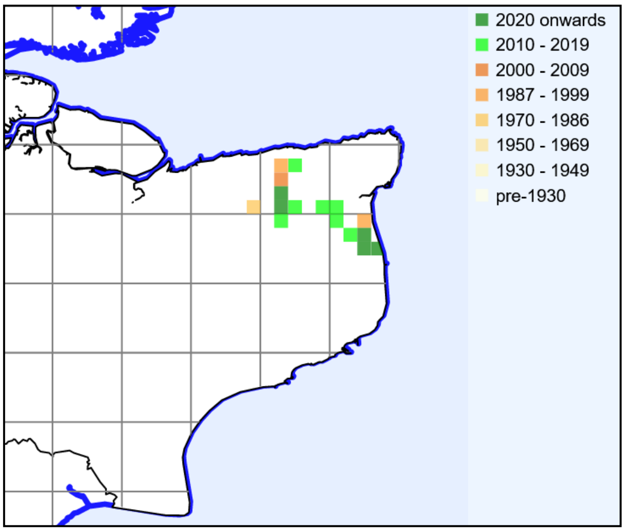
[609] *Botanical Society and Exchange Club Report for 1946-47* (1948), **13(4)**: 371.



Potamogeton friesii **Kent records to 2024 mapped at tetrad level, from BSBI database.**

These East Kent fens have their origins in the deposition of alkaline peat in former fresh waterbodies associated with the rivers and streams discharging towards the Wantsum. They have continued to supply records for *Potamogeton friesii*: by Francis Rose in fen dikes at Hacklinge (1946), between Preston and Grove Ferry (1949), at Preston Marshes (1962); and by Eric Philp at Stodmarsh (1958). Philp (1982) gave it in four tetrads between Canterbury and Sandwich, but these had become seven in Philp (2010), in which the species was assessed as scarce, in lakes, marsh dikes and slow-flowing rivers or streams. Our 2010-24 data show 12 tetrad records (18 monads).

Stodmarsh, habitat. Photo by Lliam Rooney, 18 May 2014

It is possible, but unlikely, that the increase in records represents an expansion of distribution; it is more likely to be an artefact of recording. Thorough recording can show a significant presence in the pondweed's core areas: an English Nature survey in 1996 at Stodmarsh found it in 4.1% of the 169 ditches surveyed - on a par with *Potamogeton natans* (Broad-leaved Pondweed); more widespread than *P. acutifolius* (Sharp-leaved Pondweed) and *P. lucens* (Shining Pondweed); less widespread than *P. crispus* (Curled Pondweed), *Stuckenia pectinata* (*P. pectinatus*, Fennel Pondweed) and *P. pusillus*(Lesser Pondweed). The number of Stodmarsh ditches in which *P. friesii* is known has since been substantially increased by Alex Lockton's investigations and is regarded by him as frequent in ditches and pools, possibly more so in western parts of the reserve.[610]

Its associates are said to include these last three pondweeeds, *Ceratophyllum demersum* (Rigid Hornwort), *P. perfoliatus* (Perfoliate Pondweed) and *Ranunculus circinatus* (Fan-leaved Water-crowfoot).[611] These last three species were not strongly associated in the 1996 survey: *P. perfoliatus* was not present; *C. demersum* was only found in two ditches also occupied by *P. friesii*, and *R. circinatus* only once. *Hydrocharis morsus-ranae* (Frogbit) was a more constant associate, occupying five out of the six ditches in which *P. friesii* was present. In the Worth / Lydden valley fens, *Potamogeton lucens* (Shining Pondweed) and *Utricularia vulgaris* (Greater Bladderwort) were recorded in association in 2022.

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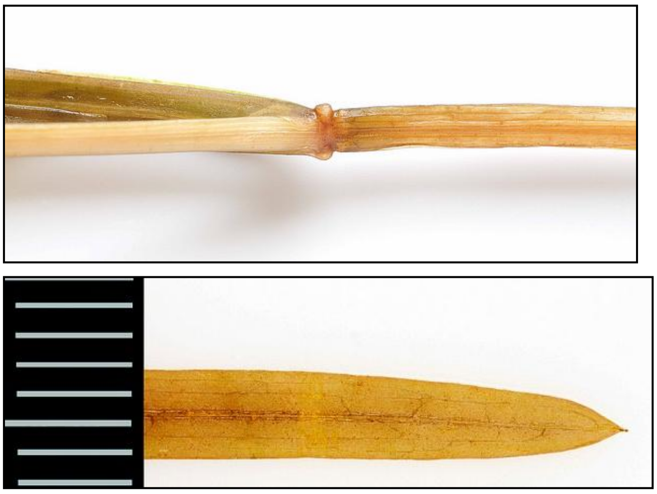
[610] Lockton, A. (February 2023). *The Flora of Stodmarsh National Nature Reserve.*

[611] Preston, C.D. (1994). Potamogeton friesii Rupr. Flat-stalked Pondweed. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

P. friesii is perhaps closest in appearance to *P. obtusifolius* (Blunt-leaved Pondweed), a species with a somewhat enigmatic distribution in the county. The former, however, has stipules which are prominently veined and tubular at the base; well-developed, semi-globose glands at the nodes; shorter, narrower leaves with, usually, five unequally spaced veins. The characteristic of tubular stipules (and, occasionally, discernible nodal glands) is shared by *P. pusillus,* which, however, normally has narrower (less than 1.5mm wide), generally 3-veined leaves with an acute apex (rather than the abruptly contracted and mucronate apex of *P. friesii*.)



Nodal glands (above) and leaf tip (below), from Stodmarsh.
Photos by Lliam Rooney, 20 May 2014

Site	Grid reference	Site status	Last record date	Recorder	Comments
Westbere Marshes	TR1860	SSSI	June 1991	CD	TR 1870 6007, River Corridor Survey Great Stour – Stodmarsh Valley.
Wickhambreaux	TR25J		1991-99	EGP	
Wickhambreaux - Preston	TR2359	SSSI	(1) 5 July 2016 (2) 4 May 1996	(1) KBRG meeting (2) NFS	(1) A small amount in a channel at TR 23079 59979. (2) East of Frognall Fruit Farm, North half of gravel pit lake.
Stodmarsh	TR2261	SSSI, National Nature Reserve	(1) 15 July 2022 (2) 11 July 2022 (3) 12 August 2021 (4) 10 October 2020 (5) 11 August 2016 (6) 3 July 1974	(1) AL, RH (2) PW, DG-S & HS (3) AL (4) AL (5) AL, LR (6) EGP	(1) TR 2291 6152, TR 2299 6154, ditch survey. (2) TR 2299 6154, ditch survey. (3) TR 22(1) 86 6199, ditch with grazed margin. (4) Ditch at TR 2277 6190. (5) TR 2234 6194, un-numbered ditch. (6) Determined by Dandy & Taylor.
Stodmarsh	TR2262	SSSI, National Nature Reserve	(1) 9 August 2022 (2) 12 August 2021 (3)11 August 2016 (4) 4 August 2016 (5) July/August 1996 (6) June/July 1991	(1) AL, KO (2))AL (3)AL, LR (4) AL (5) PW & others (6) CD	(1) TR 2256 6207, ditch survey. (2) TR 2274 6209, ditch with grazed margins; TR2284 6206. (3) TR 2236 6200, un-numbered ditch. (4) (a) TR 2262 6219, at end of ditch 36. (b) TR 2293 6205, ditch 65. (c) TR 2281 6205, ditch 56. (d) TR 2296 6200, ditch on edge of compartment 17E. (5) Stodmarsh NNR ditch survey. Ditch 36. (6) River Corridor Survey Great Stour – Stodmarsh Valley: (a) TR 2224 6223; (b) TR 2259 6244 [Sites

					are on north side of Stour, not NNR.]
Chislet Marshes	TR26H		10 June 2000	EGP, JBev	
Chislet Marshes	TR26I		1991-99	EGP	
Stodmarsh	TR2361	SSSI	(1) 15 July 2022 (2) 11 July 2022 (3) 11 July 2022 (4) 9 August 2021 (5) 10 July 2013 (6) July/August 1996	(1) AL, RH (2) AL, BH (3) AL, RH, BH (4) AL, JM (5) AL, JM (6) PW & others	(1) TR 2318 6166, TR 2327 6170, TR 2305 6158, Stodmarsh ditch survey. (2) TR 2321 6176, TR 2316 6186, Stodmarsh ditch survey. (3) TR 2326 6170, TR 2331 6174, Stodmarsh,ditch survey. (4) TR 2304 6194. (5) TR 2314 6197, ditch 86, conf. CDP. (6) Stodmarsh NNR ditch survey. Ditch 120.
Stodmarsh	TR2362	SSSI, part National Nature Reserve	(1) 8 June 2023 (2) 9 August 2021 (3) 20 June 2021 (4) 30 May 2021 (5) 7 July 2018 (6) 30 May 2017 (7) 4 September 2016 (8) 31 August 2016 (9) 30 May 2014 (10) 23 May 2014 (11) 18 May 2014 (12) 10 July 2013 (13) July/August 1996	(1) AL (2) AL (3) AL, JM (4) AL, JM (5) AL, RB (6) AJ (7) AL, JM (8) AL, JM (9) AL, JM (10) AL, JM (11) KFC meeting (12) AL, JM (13) PW & others	(1) TR 2301 6207. (2) TR 2322 6216, ditch by cattle grazed field. (3) TR 2308 6211. (4) TR 2308 6200. (5) (a) TR 2340 6276, ditch in front of dipping platform. (b) TR 2328 6291, ditch 114. (c) TR 2326 6260, ditch in front of Feast's Hide. (6)(a) TR 231 621, ditch 84. (b) TR 230 620, ditch 77. (7) TR 234 628, ditch 135. (8) TR 2316 6244, ditch 90. (9) TR 2343 6229, compartment 44, in front of Harrison's Drove. (10) (a) TR 2327 6260, ditch 103 in front of the Feast's Hide. (b) TR 2340 6276, ditch 118. (11) abundant in a ditch from TR 23042 62076 to TR 23124 62172 (12) TR 2307 6210, ditch 77. (13) Stodmarsh NNR ditch survey. Ditches 76, 83, 103, 118, 139.s
Marshside	TR2366		1997	ACH	TR 2316 6636.
Preston Valley	TR2461		(1) 30 July 2015 (2) 1997	(1) SB (2) ACH	(1) Small amount in ditch by sluice at TR 2445 6190 with *Potamogeton crispus*. (2) TR 240 610, Preston Marshes.
North West of St Nicholas at Wade	TR2467		13 May 2016	SB	Wade Marsh stream by the A299, TR 2480 6733. Identified using characters: leaf width, venation, leaf tip and pronounced nodal glands.
Ash Level, Paramour Street	TR2861		15 June 2016	SB	Abundant in a fishing lake at TR 2316 6636, with *Stuckenia pectinata* (*Potamogeton pectinatus*). No fruits and plants beginning to age. Identification made from conspicuous nodal glands, distinct lateral veins on leaves which were tapering to a distinct mucronate apex.
Ash Level, Lower4 Goldstone	TR2961		20 June 2014	SB	Marsh dyke at TR 29491 61503, with *Lemna gibba*, *L. trisulca*, *Spirodela polyrhiza* and *Callitriche obtusangula*
Richborough Farm	TR3160		20 June 2014	SB	Abundant in ditch at TR 31344 60515 by footbridge with *Elodea nutallii*, *Lemna trisulca*, *Lemna minor* and *Spirodela polyrhiza.*
Worth	TR35I		1991-99	EGP	
Worth	TR3356		24 June 2014	SB	A few plants at TR 33992 56723 in the Delf Stream by bridge

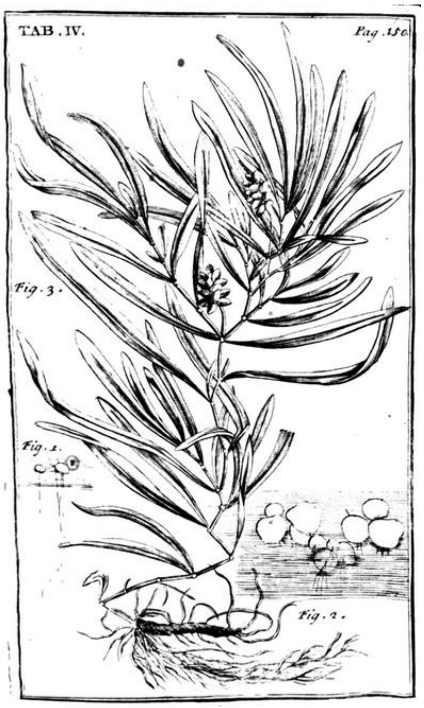
Hacklinge	TR35M, includes TR3454, TR3455, TR3555	SSSI	(1) 21 July 2022 (2) 1 August 2015 (3) 1991-99	(1) SB (2) SL, LR (3) EGP	(1) RSPB reserve, Willow Farm, ditch between comp 8 and 7. With *Potamogeton lucens* and *Utricularia vulgaris* at TR 3594 5555. (1) Worth Minnis farmland east of Cornfield Wood, inlet of culvert on ditch beside footpath, TR 34217 55689, (two lateral veins either side of midrib). (2) TR35M
North East of Worth	TR35N, includes TR3456, TR3556, TR3557		(1) 3 July 2020 (2) 29 July 2014 (3) 22 June 2002	(1) SB (2) SB (3) EGP	(1) In the North Stream with *Ranunculus circinatus* and *Stuckenia pectinata* at TR 35222 57165 (2) (a) Occasional in Fry Dike e.g. at TR 3458 5632. (b) A few plants in shaded channel at TR 345 5638. (c) A few sparse plants in dike at footbridge, TR 3505 5637. (3) TR35N
Royal St George's	TR35P		1991-99	EGP	
Sandwich Levels	TR3556		29 July 2014	SB	A few sparse plants in dike at footbridge, TR 3505 5637.
Lydden Valley east	TR3655	SSSI, RSPB reserve	21 July 2022	SB	RSPB reserve, Willow Farm, comp 13, ditch that runs west of access track TR 36155 55719.

Potamogeton obtusifolius Mert. & W.D.J. Koch (Blunt-leaved Pondweed)

vc15 and16

Rarity / scarcity status

Potamogeton obtusifolius is locally frequent throughout most of the British Isles in lake, ponds, canals and streams and its threat status for conservation purposes is regarded as of 'Least Concern', both in England and in Great Britain as a whole. Despite having been recorded as widely scattered in the Kent Weald in the 1970s, it has seldom been found in Kent after then[612], and so is **scarce,** bordering on **rare**. It is a Kent axiophyte and so is indicative of good habitat.


TAB. IV.
Pag. 150.
Fig. 3.
Fig. 1.
Fig. 2.

From Ray's Synopsis, 1724

Account

The first record for the British Isles is a manuscript description by the Rev. Adam Buddle (died 1715) '*Potamogiton gramineum latiusculum, foliis et ramificationibus densissime stipatis'*. This was cited by Dillenius, editor of the third edition of John Ray's *Synopsis Methodica Stiripium Britannicarum* (1724), as '*In fossis prope Deptford*' (in ditches near Deptford) and is illustrated in the *Synopsis*.

Hanbury & Marshall (1899) considered the species to be 'not common' in the county and gave a few, widely scattered records: in the River Cray (1793); in ditches about Greenhithe (1836); in shallow waters about the Faversham Powder Mills (1777); at Stourmouth and Ham; in the Stour near Wye; marshes near the Medway above Tonbridge; pond at Marden[613]. It is not easy to see what these records have in common, beyond aquatic habitat, although continuity in the vicinity of the Marden record is suggested by its discovery by Francis Rose and Ronald Boniface in 1952 in two ponds one mile north of Marden. Also, the River Cray seems to have continuity with its finding in 1980 above the Five Arches of Foots Cray Meadows, TQ 481 717, by Rodney Burton, Elizabeth Norman and Geoff Joyce.

Shadoxhurst. Photo by Stephen Lemon, 24 August 2014

Francis Rose considered the pondweed very rare, to be found in a few Wealden ponds, although the only such ponds that he mentioned in his MS *Flora* as (then) being recent sites, apart from Marden, were at Leighbridge, W.N.W. of Headcorn (1935-49) and north of Scarletts, Cowden. A non-Wealden record was Luddenham Marshes (1961, found by Hector Wilks). Subsequent recording developments are somewhat mysterious. Philp (1982) gave records for 1971-80 in 13 Wealden tetrads[614], including a cluster near Cowden. Philp (2005), however, gave none for 1991-2005, saying

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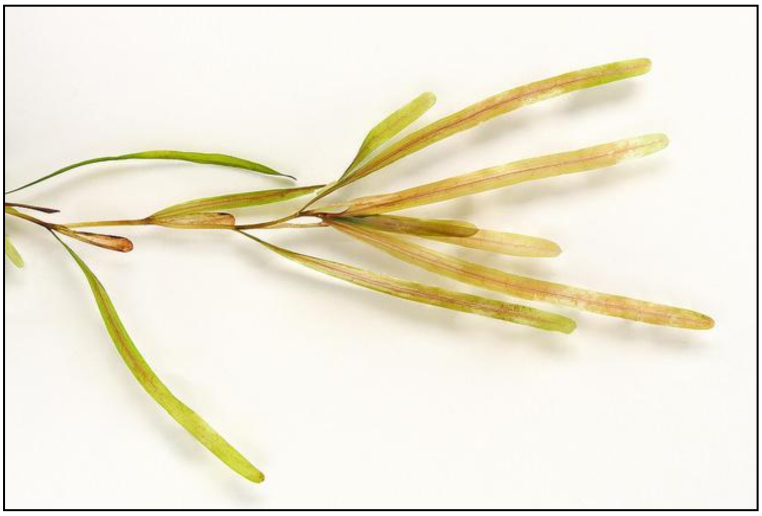
[612] Records made in May/June 1991, as part of a survey of Richborough Stream (TR 2925 6165, TR 2975 6145, TR 3015 6135), are discounted here. On distribution alone, these are likely to be *Potamogeton friesii*.

[613] Hanbury & Marshall (1899) gave Edward Jenner's Flora of Tunbridge Wells (1845) as the source for this, but there are specimens collected by Marshall in Manchester Museum labelled Pools near Marden, and in the University of Birmingham herbarium labelled just as Marden, both gathered on the same day in 1893.

[614] These were: TQ43P, TQ44F, TQ44K, TQ44V, TQ44W, TQ54P, TQ54U, TQ63N, TQ83A, TQ83K, TQ83P, TQ83Q, and TQ93Q. Records for Philp (1982) were often contributed, rather than made by Eric Philp, and there are other sources which give detail for some otherwise



From Shadoxhurst. Photo by Lliam Rooney, 29 May 2015

that 'The only explanation is that the correct habitats have not been looked at during the right time of year, as the plant must surely exist in a few ponds in the county'.

The period after the Philp (1982) survey of 1971-80 is not devoid of records, however. There are a couple of sightings in the Smallhythe area, the first in 1987, TQ 893 300, by D.K. Clements and E.K. Goldie-Smith, and in second in 2008, TQ 893 300, by Joyce Pitt. Also in 2008, the Environment Agency noted the pondweed in the irrigation reservoir at the extension of Hothfield nature reserve, TQ 96341 45889.

Shadoxhurst, habitat. Photo by Stephen Lemon, 24 August 2014

After then, however, there were no reported sightings until the pondweed was found in August 2014 by Stephen Lemon at a pond near Shadoxhurst, TQ 96103 36485, in the middle of an arable field. This had been dredged by the farmer some 15 years beforehand, to prevent sheep getting stuck in the silt, and ongoing maintenance consisted of clearing the banks more or less annually. *P. obtusifolius* was growing abundantly in submerged patches appearing reddish under the water. It may have benefited from the pond being on high ground without ditches feeding nutrients into it, and with any earlier nutrient assemblage having been removed by dredging. Associated species included *Potamogeton natans* (Broad-leaved Pondweed) and (probably) *Potamogeton berchtoldii* (Small Pondweed). It was still present in May 2015 and 2017.

A further record was made by Chris Forster Brown in July 2017, in a species-rich ditch north of the Royal Military Canal between Kenardington and Warehorne, TQ 98183 31925. Some habitat affinity with the last record was shown by a sighting by Sue Buckingham and Richard Lansdown in September2020 in a ditch on running alongside the railway line south from TQ 86885 31950, on part of the Upper Levels of the Rother catchment. Also, in August 2022, Ben Benatt found a couple of big patches in the River Beult south east of Yalding, TQ 70856 49520,

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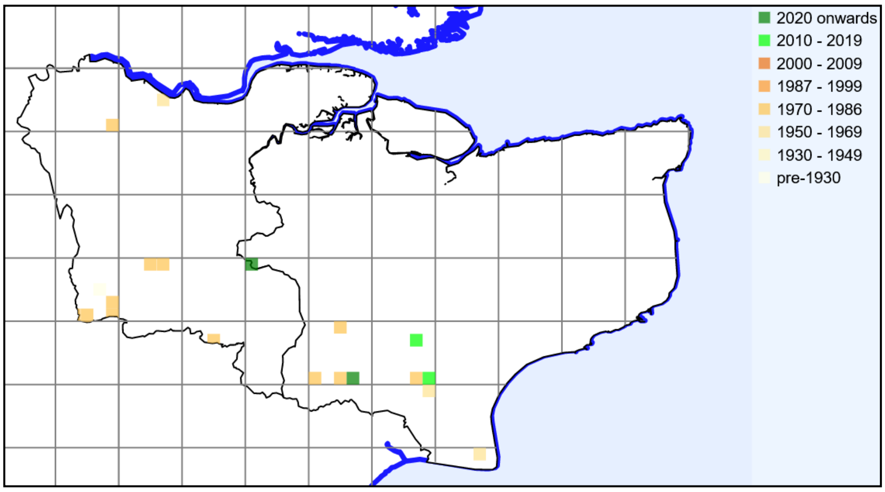
submerged in the plain tetrad records of Philp (1982). Thus, TQ43P is Furnace Pond, Cowden, TQ4539 (RAC, 1973); TQ44F relates to the east slopes of Dry Hill (RAC, 1973) [NB the vice county boundary runs along these slopes]; TQ54U is TQ5549 (east pond at Bourne Place, Hildenborough: RAC, 1972); TQ83A is presumably a site called south of Benenden; TQ83K is TQ8530, Rolvenden Layne (WJM, 1973); TQ83P is presumably Biddenden (WJM, 1974); TQ83Q is another Rolvenden Layne record (WJM, 1972), but may also apply to a site south of Tenterden (WJM, 1974). All these more detailed records were of specimens confirmed by Dandy and Taylor, so there is no doubt about identity. The fact that the same two recorders were involved suggests that they were adept at spotting the species and/or habitat.

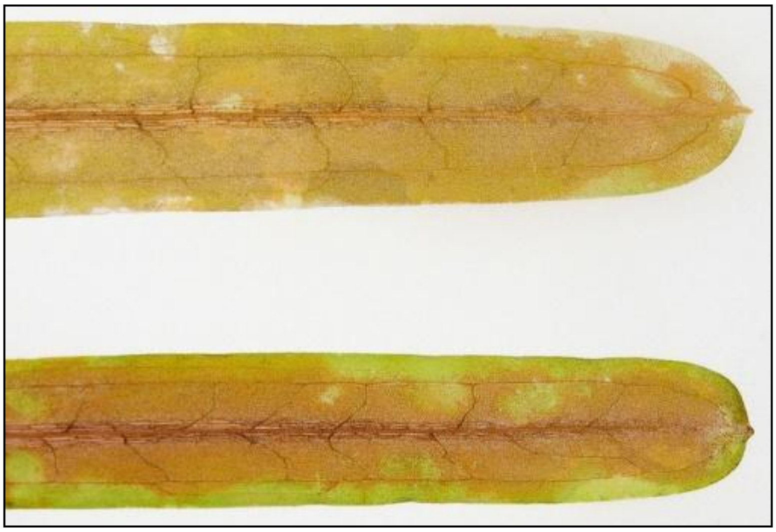
growing in mid-channel but closer to the south bank, i.e. the vc16 side, the river being the vice county boundary.

It is curious that recording has been so patchy in the past, and it is difficult to draw any conclusions as regards trends. It would be unsafe to suppose that there has been a decline since the early 1970s, when the number of records probably reflected recorder effort and expertise, and it would be worth reinvestigating some of those sites where the details are sufficient to enable this.

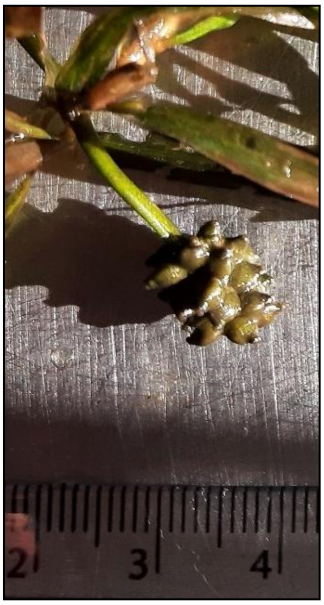


Potamogeton obtusifolius **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Potamogeton obtusifolius is generally treated[615] as a plant of still, shallow waters, seldom those which are rich in nutrients. It can be very abundant in small water-bodies, forming a mass of foliage just below the water surface, pale green in colour, often tinged pink along the midrib, or pinkish or reddish brown throughout. Differences between this species and *Potamogeton friesii* are described under the latter's account. *Potamogeton obtusifolius* and *Potamogeton berchtoldii* (Small Pondweed) have similarities, but may usually be separated by the leaves of *P. berchtoldii* being narrower (most less than 2mm wide), shorter (generally less than 5cm) and pale to olive or brownish green (not pinkish/reddish).



From Shadoxhurst. Photo by Lliam Rooney, 29 May 2015



From Yalding, fruit. Photo by Ben Benatt, 11 August 2022

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[615] E.g., in Preston, C.D. (1995). *Pondweeds of Great Britain and Ireland*. Botanical Society of the British Isles, London.

Potamogeton pusillus L. (Lesser Pondweed)

vc15 and 16

Rarity / scarcity status

Potamogeton pusillus is a pondweed fairly frequent across much of the British Isles, whose threat status for conservation purposes is of 'Least Concern', both in England and Great Britain as a whole. From Philp (2010), it appeared to be locally **scarce**, but there may be issues of under-recording which would make it less uncommon than this. Even so, taking into account recent records there appears to have been a 54% decline[616] between 1971-80 and 2010-22 and in view of this and its now near total absence from West Kent, the species is being retained on the register for monitoring.

Account

The earlier history of Lesser Pondweed in Kent is complicated by confusion between *Potamogeton pusillus* and *Potamogeton berchtoldii* (Small Pondweed), not fully resolved until the 1940 studies of Dandy and Taylor[617]. The first Kent (and British) record of *P. pusillus* is sometimes given as in William Howe's *Phytologia Britannicarum* (1650), 'Potamogeton pumilum non descriptum...Between Carleton [Charlton] and Wulwich [Woolwich]'; but there is no way of telling whether this was *pusillus* or *berchtoldii*. Hanbury & Marshall (1899), unusually for a Flora of that time, distinguish *berchtoldii* in giving a record by Marshall for it at Marden, although treating it as a form of *pusillus*.

Early records are best treated as those which Dandy and Taylor identified from specimens. In West Kent, they included: 1875 Greenhithe; 1880 Erith; 1881 Northfleet; 1922 Gravesend; 1939 Thames & Medway Canal, Higham. In East Kent, they included: 1875 Romney Marsh; 1880 Royal Military Canal; 1930 west of Seasalter; 1933 Lydd; 1938 Cleve Marshes; 1938 Great Stour below Grove Ferry. The pattern here seems to be one of still or slow-moving water in ditches, canals and the River Stour, focussed on north Kent and Romney Marsh.

From the Dowels. Photo by Lliam Rooney, 19 July 2014

This pattern continued into the 1950s and 60s. In the north Kent marsh areas, it was found in a bomb crater at Shornmead Fort by Clive Stace in 1963 and a pit north of Shorne by Peter Hall. In the Stour catchment, Francis Rose's records include Stodmarsh (1955) and in a ditch west of Sandwich (1946). In Romney Marsh, Francis Rose also noted it in dikes by Selby Farm south of Lympne (1958) and in the canal west of Kenardington bridge (1959). For the first time, however, it was being confirmed from the Medway catchment (including its Beult tributary): in a stream north of Collier Street (1958), in a gravel pit west of Brandbridges (1958), and in gravel pits east of Aylesford (found by Eric Philp in 1962).

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[616] The decline is measured from a baseline of the 1971-80 survey (Philp, 1982) with 37 tetrads recorded. If one instead takes the BSBI's date class 1970-86 with 46 tetrads recorded, then the decline would be 63%. However, the 1970-86 records include intensive ditch survey work, where there has not been subsequent comparable effort, and this might cause over-statement of measurement of subsequent decline.

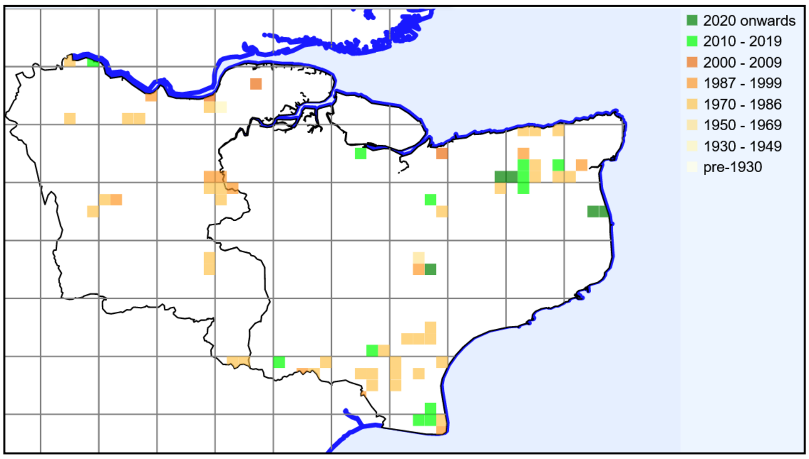
[617] Dandy, J.E. & Taylor, G. (1940). Studies of British Potamogetons – XII *Potamogeton pusillus* in Great Britain; XIII *Potamogeton berchtoldii* in Great Britain. *Journal of Botany* **78**: 1-11; 49-66.

The 1971-80 county survey (Philp, 1982) accounted for 37 tetrads, where *P. pusillus* was present in rivers, dikes and flooded gravel pits. Most finds continued to be in the Stour catchment, the inner fringes of Romney Marsh and its Wealden hinterlands, and the catchment of the lower, but non-tidal, Medway.

Yet, Philp (2010) gives only five records for 1991-2005[618]. While some aquatic plants have seen rapid increase and then decline, this is normally a characteristic of introductions, not natives. It seems more likely that the decrease is substantially an artefact of recording, rather than any population change. Eric Philp was not convinced that *P. pusillus* and *P. berchtoldii* were distinct species, and said so in Philp (1982). This was particularly because he considered that specimens were found with the characters of both species. In his 1982 account he stated under *P. berchtoldi*i that the records used were for plants which had characters clearly only for that species (and, by implication, this applied to *P. pusillus* as well). When in Philp (2010) he wrote that all five 1991-2005 specimens had been sectioned and carefully examined under a microscope before being confirmed, this indicates a continued level of scepticism about the species which may have affected willingness to record. That willingness, however, was not an issue in relation to *P. berchtoldii*, which had more records in Philp (2010) than in Philp (1982).

From the Dowels. Photo by Lliam Rooney, 23 August 2012

Our more recent records do not show *P. pusillus* as this scarce: there are 17 tetrad records (22 monads) for the period 2010-24.



***Potamogeton pusillus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Distribution mapping is given here at both tetrad and monad resolution, the former showing more clearly the historic losses, where the original records were only made at tetrad level. Unusually, the monad map shows a number of monad records from time (pre-2010) when recording was not often at this level. They reflect some intensive ditch survey work outside the scope of the Philp (1982 and 2010) surveys.

P. pusillus is regarded as growing in a wide range of aquatic habitats, sometimes with *P. berchtoldii*, but it is more tolerant of brackish conditions than that species[619]. Kent records for 2010 onwards include presence in ponds, gravel pits, lakes and drainage channels. It was found in 2018 in a pond in Lydden Valley which had only been created the previous year and was much visited by birds, presumably responsible for its arrival. Associated species have been little recorded in Kent, but it has been found growing with *Stuckenia pectinata* (*P. pectinatus*, Fennel Pondweed) and with *Potamogeton trichoides* (Hairlike Pondweed).

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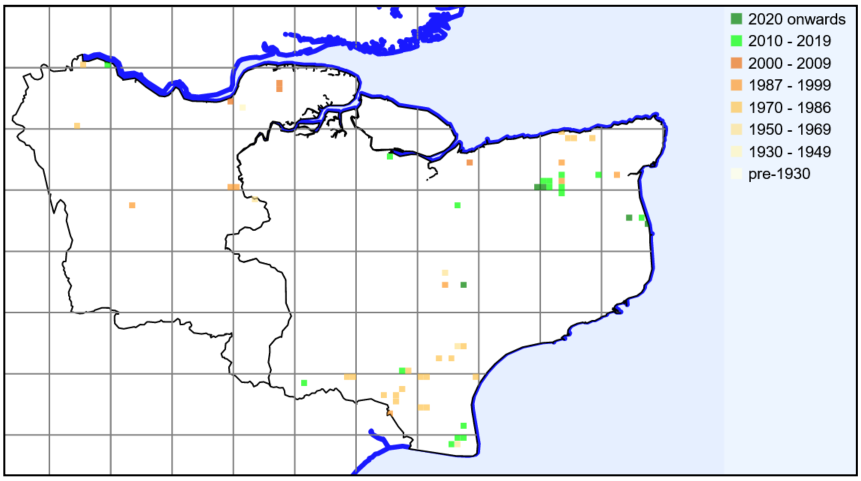
[618] A dike on Swanscombe Marshes TQ57X; a flooded gravel pit at Aylesford TQ75J; A marsh dike on The Dowels TQ93Q; a flooded gravel pit at Dungeness; and a marsh dike at Stodmarsh TR26G.

[619] Preston, C.D. (1995). *Pondweeds of Great Britain and Ireland*. Botanical Society of the British Isles, London.

Potamogeton pusillus Kent records to 2024 mapped at monad level, from BSBI database.



From the Dowels. Photo by Lliam Rooney, 24 August 2012

It is variable in habit and leaf width, and can be quite similar to several other pondweeds. From *P. berchtoldii* and *P. trichoides* it is separable by its tubular stipules, i.e. the stipules form a fully connected ring of tissue, not just a tube created by overlapping tissue. It is a fiddly business checking these; best done by sectioning a young shoot with its stipule and examining the cross section under a microscope, having removed the shoot from the surrounding stipule if practicable. It should be borne in mind that the stipule may not be tubular for its full enclosing length and the tube tends to split with age. The presence of a tubular stipule, together with (normally) 3-veined leaves not more than 2mm wide will point to *P. pusillus*.

Potentilla anglica Laichard. (Trailing Tormentil)

vc15 and 16

Rarity / scarcity status

Potentilla anglica grows scattered across the British Isles, although some records may be of its hybrid, *Potentilla* x *mixta*, and its threat status for conservation purposes is of 'Least Concern'. In Kent, there is some evidence of decline, although this is subject to doubt, and it is verging on **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Account

Trailing Tormentil was first recorded in Kent by Edward Jacob in his *Plantae Favershamienses* (1777) '*In Broom fields at* Hernhill – *common*'. Francis Rose acknowledged this as apparently the first, but qualified it as 'if correct'. The habitat sounds appropriate, but it is curious that Jacob did not also record common *Potentilla. reptans* (Creeping Cinquefoil).

Lamberhurst Quarter. Photo by Lliam Rooney, 13 June 2015

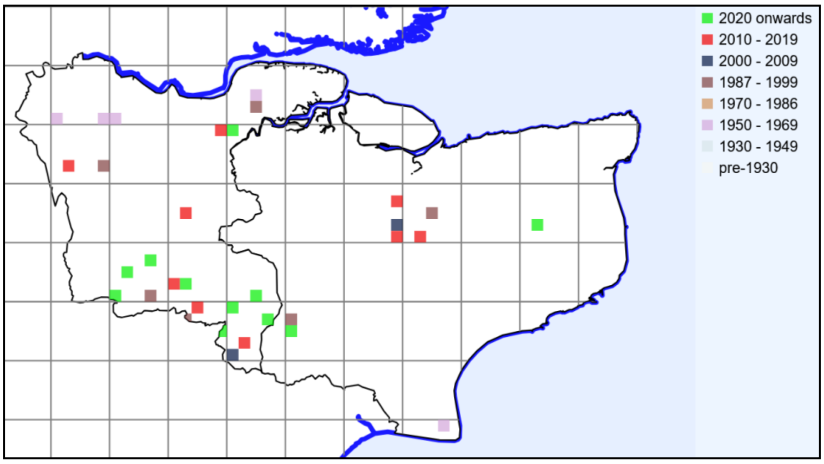
Hanbury & Marshall (1899) described it as a plant of woods and banks, not really uncommon, but confounded with *Potentilla erecta* (Tormentil) by many observers. This confusion seems a little surprising, given that there is greater scope for mixing up the hybrids between *P. erecta* and *P. anglica* (*P.* x *suberecta*), between *P. erecta* and Creeping Cinquefoil *P. reptans* (*P. x italica*), and between *P. anglica and P. reptans* (*P.* x *mixt*a). Hanbury & Marshall dealt with all these hybrids, which was a fairly advanced position for a Flora at that time, given that they (probably Marshall in particular) felt it necessary to comment on the scepticism still felt by the more conservative botanists about hybrids generally. They listed records for *Potentilla anglica* widely across the county, apparently on a preponderance of acid and neutral soils.

Lamberhurst Quarter. Photo by Lliam Rooney, 13 June 2015

Francis Rose in his manuscript *Flora* described the species as a native of wood borders, rides, heaths, and scrub, usually on light soils, but occurring on heavy loams and even on Weald and Wadhurst Clays: well distributed, especially in the Weald and on the Greensand, but uncommon generally. Similarly, Eric Philp in relation to the county 1971-80 survey (Philp, 1982) found Trailing Tormentil, a plant of woodland rides, woodland edges, heaths and sandy banks, to be rather scarce in the county and many records, on being checked, had proved to be mis-identified. His confirmed or reliable records amounted to 14 tetrads, listed but given without a distribution map.

In the 1991-2005 survey (Philp, 2010), only seven tetrad records were given and the plant was described as scarce and probably declining. The extent of any decline since the 1970s is not easy to ascertain, given that our 2010-24 records amount to 20 tetrads (24 monads) so that the apparent 50% drop for 1991-2005 is questionable as well as, perhaps, ant earlier decline

The accompanying tetrad distribution map is a little misleading in that records from Philp (1982) have not made their way onto the BSBI database, but insofar as other historic records were made at least at tetrad level and appear here without having been re-found since, then tend in be the same general areas as more recent finds, and these can be related to acid geology, but noting that where on the Downs dip slope, they are not likely to be on chalk, but rather on somewhat acid soils, clay with flints or plateau drift. As regards the few north easternmost records from the 1950s/1960s, these were probably on sands and gravels, lost to metropolitan development.



Potentilla anglica Kent records to 2024 mapped at tetrad level, from BSBI database.

Habitat: Cobham Wood, Ranscombe (gravelly soil, some winter flooding).
Photo by Richard Moyse, 16 October 2020

Identification difficulties[620] exist because *P. anglica* arose as a species through hybridisation between *P. erecta* and *P. reptans*, followed by chromosome doubling. It therefore has some characters which are intermediate between those two species and others which are derivative from the chromosome doubling. It has at least some 4-petalled flowers (from *P. erecta*), but may also have 5-petalled ones (from *P. reptans*). It is fertile and can self-pollinate, which is an effect of chromosome doubling (a straight hybrid between *P. erecta* and *P. reptans* or between *P. erecta* and *P. anglica* would be sterile), so the fertile swollen carpels should be observed after flowering. Clearly, a plant has to be sufficiently mature for this observation to be made. In practice, this should be possible if there are at least three withered flowers further back down the stem from an open flower or bud, when the third – or any older one – is the one to test.

There are other relevant characters relating to leaves and their stalks, but those of *P. anglica* may vary during the growing season so that at the outset they may look closer to *P. reptans* and later in the season, more like *P. erecta*. *P. anglica* can form large patches, as it roots at the nodes in late summer, although not as readily as *P. reptans*. The hybrid *P. anglica* x *P. reptans* (*P.* x *mixta*) also forms patches and can be found apparently quite independent of any parents; but *P. erecta* x *anglica* (*P.* x *suberecta*) does not, and this inability to spread means that it is unlikely to be found otherwise than near the parents.

Lamberhurst Quarter. Photo by Lliam Rooney, 13 June 2015

Potentilla x *mixta* is three and a half times more likely to be found than pure *Potentilla anglica* - our 2010-24 data and Philp (1982 and 2010) all agree in this.

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[620] Dealt with by B. Harold (1998). *Potentilla erecta / P. reptans / P. anglica* and hybrids. In (ed. Rich, T.C.G. & Jermy, A.C.) *Plant Crib,* Botanical Society of the British Isles, London. Also Harold, B. (1994). *The Potentilla erecta-reptans* group – some practical hints for identification. *BSBI News* **66**: 13-15.

Potentilla argentea L. (Hoary Cinquefoil)

vc15 and 16

Rarity / scarcity status

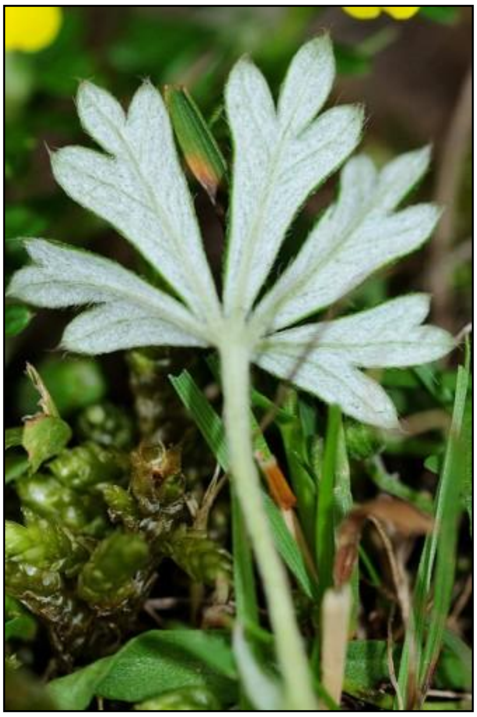
Potentilla argentea is fairly widespread on dry sandy or gravelly ground in Great Britain, more frequent in the south east than elsewhere, especially in East Anglia, but less so in Kent and East Sussex. In both England and Great Britain as a whole it is considered to be **Near Threatened**. A comparison of the species' English area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 26% in the likelihood of its being recorded. In Kent, the decline between 1971-1980 and 2010-19 could be regarded as 22%, but this is not statistically significant. Hoary Cinquefoil is **scarce** in the county. It is a Kent axiophyte and so is indicative of good habitat.

Littlebourne. Photo by Lliam Rooney, 29 July 2011

Account

The first published Kent record is by John Blackstone in his *Specimen Botanicum* (1746), 'In pascuis arenosis aut glareosis.' [In sandy or gravelly pastures] 'On *Blackheath* in the Road to *Charlton, Kent'*. Hanbury and Marshall (1899) regarded Hoary Cinquefoil as locally frequent on sandy and gravelly ground and gave many other records for north west Kent with comparable soil conditions, including Keston, Hayes Common, Bostall Heath, Chislehurst and near Abbey Wood. Gravel pits were mentioned near Chalk, at Cockset Wood near Faversham, and at Newnham near Faversham (where Edward Jacob recorded it in a road hedge in 1777; and it was still to be found in a gravel pit in 1890); but East Kent records were much more patchy.

Francis Rose noted many gravel- and sand-pit records (six out of 20 of his twentieth century sites) and described Hoary Cinquefoil as a native of dry sandy or gravelly banks, open grassland and old pits; frequent on the Eocene and later sands and gravels north of the Downs, but local; very rare south of the Downs, on Folkestone Sands in the non-tidal Medway catchment only, unrecorded in the Weald[621].



Littlebourne. Photo by Lliam Rooney, 29 July 2011

Philp (1982) noted nine tetrads for the species, all in the northern half of the county, and generally relating to finds on or near footpaths. Although it was looked for at all former known sites for the purposes of the 1991-2005 survey published in Philp (2010), it could only be found in four tetrads, of which just one corresponded to a Philp (1982) tetrad. The reason for the decline was considered to be loss or destruction of habitat. The decline is not as great as this, given that our 2010-24 records are for eight tetrads (nine monads). However, as well as being a plant of the northern half of the county, it is now almost entirely a West Kent plant; a gravelly bank at Littlebourne (in an area where known at least since 1949) is the only survivor of previous East Kent records.

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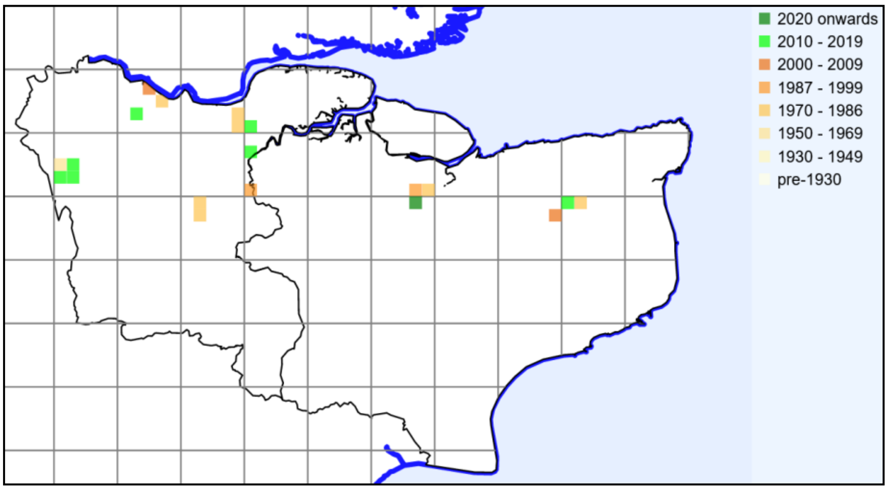
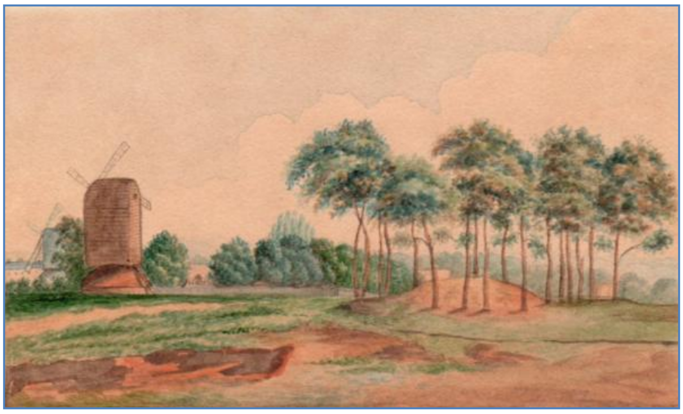
[621] As for Wealden records, Thomas Forster in his *Flora Tonbrigensis* (1816) describes it as 'In pastures, not uncommon' but this sounds unlikely. Indeed, Hanbury & Marshall (1899) mis-quote this as 'not common', which would be a little more plausible, but they remark that Edward Jenner (*Flora of Tunbridge Wells*, 1845) did not find it, so the pointers are towards the record being an error.



***Potentilla argentea* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Kent habitats are those more widely characteristic of *Potentilla argentea*: infertile, well-drained, sandy or gravelly soils, often on banks (which may accentuate drainage and sun exposure) and in open conditions without other vegetation over-shading. Whilst it is said[622] that in eastern England, particularly Breckland, it has a preference for light soils of heathland and uncultivated areas not subject to disturbance, in Kent its occurrences are often related to disturbance. This is apparent from the number of gravel- or sand-pit related occurrences, and to the comments in Philp (1982) about presence on or near footpaths. The footpath sites may well be related to a need for competition to be reduced through open ground created by trampling.



Blackheath, habitat, c.1814.

This is also reflected in our first county record: 'On *Blackheath*' (with its sandy, pebbly open ground) 'In the road' (obviously, eighteenth century roads were not tarmacadamised, and this route would have been a well-used dusty, rutted track across the unenclosed common and, being unconstrained, it would have no doubt have spread across the terrain, such that growing **in** the road would have been no surprise. Similarly, the pit sites have clearly been affected by significant disturbance, initially clearing competitive vegetation, but also through accentuating infertility by the removal of any soil covering.

Putt wood, habitat. Photo by Danny Chesterman, 29 July 2023

As it appears that *Potentilla argentea*, a perennial reproducing from seed, is slow to colonise new sites, it may need locations which themselves are slow to accept colonisation by any perennial species, and hence delaying the onset of competition; the precise requirements for dispersal and establishment in situ are still not fully understood.[623] Some efficiency of pollination has been suggested by the observation that the petals of *Potentilla argentea* wilt and are shed speedily after pollination, and unpollinated flowers continue with fully turgid petals. However, as a pseudogamous apomict, its pollination would simply trigger asexual reproduction. Accordingly, there may be a level of local variation of population due to the general absence of male inheritance, and Sell & Murrell[624] place *Potentilla argentea* in five microspecies, not yet adopted in general British recording: *Potentilla decumbens*, *P. confinis*, *P. demissa*, *P. tenuiloba* and *P. argentata*, which are keyed out on the height and inclination of flowering stems, together with leaflet width and degree of toothing.

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[622] P.J.O. Trist (1994). Potentilla argentea L. Hoary Cinquefoil. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

Its associated species at Littlebourne included, in 1985, the rarity *Lotus angustissimus* (Slender Bird's-foot-trefoil) and at Dartford Heath, plants of dry acid ground: *Agrostis capillaris* (Common Bent), *Cerastium semidecandrum* (Little Mouse-ear), *Rumex acetosella* (Sheep's Sorrel) and *Spergularia rubra* (Sand Spurrey).

Potentilla argentea is readily distinguishable from all other native *Potentilla* species by the dense white woolly undersurface of the leaves, whose edges curve inward below, so that the green upper surface appears as a margin when viewed from underneath.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Keston Common (metropolitan vc16)	TQ4163	Access land	(1) 14 August 2016 (2) 2013 (3) 1990 (4) 1988	(1) SL (2) JJ (3) JP (4) JP	(1) TQ 41800 63867, Keston Common, gravel extraction gulley (Blackheath Pebbles), open south west end of gulley. Spread-out patches of plants, some in flower, across an c.10 metre scrubby strip of vegetation dominated by Bramble and Gorse. (2) TQ 416 638, Keston Common: extraction gulley south of car park (3) Over 50 plants. (4) TQ 418 638 B, at foot of earthwork, several – reappeared after 4 years' absence...
Keston (Holwood) (metropolitan vc16)	TQ4263, TQ4264		(1) 7 June 2010 (2) 2010 (3) July 1988	(1) JP (2) JP (3) JP	(1) TQ4264, entrance area north of 'Cricket Ground', small colony, very local. (2) Small colony, very local, TQ4263. (3) TQ4263. [Known at Holwood Park at least since 1916.]
Dartford Heath	TQ5272	Access land	(1) 24 October 2017 (2) 12 July 2013	(1) DS (2) GK	(1) TQ5272. (2)TQ 52095 72862. Three plants on sandy/pebbly ground, looking as though it had been scarified for management purposes. Associated spp: *Agrostis capillaris*, *Rumex acetosella*, *Spergularia rubra*, *Cerastium semidecandrum.*
Dartford Heath	TQ5273	Access land	13 July 1997	JS	TQ 5225 7315
Dartford Heath	TQ57G		1991-98	EGP	Called 'Wilmington', but may be same as TQ5272 or TQ5273 above.
Dartford Marshes	TQ57N		(1) 1 November 2002 (2) 2002	(1) EGP, PH (2) MG	(1) Tetrad reference only, no detail. (2) TQ 5405 7647, Joyce Green Lane, west side. [Known on a gravelly bank at TQ 546 761, 1931-62.]

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[623] Stroh, P.A. 2014. *Potentilla argentea* L.. Hoary Cinquefoil.Species Account. Botanical Society of Britain and Ireland.

[624] Sell, P. & Murrell, G. (2014). *Flora of Great Britain and Ireland*, vol.2. Cambridge University Press, Cambridge.

Stone	TQ57S		Before 1981, after 1970	Philp (1982)	This may be the same as a 1972 record by JRP at Atlas Stone Co pit.
Wrotham Heath	TQ65I, TQ65J		Before 1981, after 1970	Philp (1982)	Tetrad reference only, no detail given. [Known at sand pit west of Wrotham Heath, 1961.]
Whitehorse Wood	TQ6561		1 October 1973	FR, PR, DK	
Shorne	TQ67V		Before 1981, after 1970	Philp (1982)	Maybe Gad's Hill (GS)
Chalk	TQ67W		Before 1981, after 1970	Philp (1982)	
Eccles [?]	TQ76A		1987-88	EGP	BSBI monitoring scheme
Ranscombe	TQ7167	Plantlife reserve	(1) [not seen 2017] (2) 16 June 2012 (3) 9 May 2012	(1) [RM] (2) KBRG meeting (3) RM	[(1) comm. RM, In Jan 2017, not seen since 2012, despite management intended to favour it and deliberate searches each year, so this may well have been a temporary population introduced by forestry vehicles.] (2) c. TQ 715 675, as previously found by RM, on a path through Merral's Shaw, just off the public footpath, a scattering of plants in flower, spread along a few metre stretch of path. (3) c.TR 715 676, thirty plants of various sizes, first found by recorder on 9 May 2012 in a ride in Merrals Shaw. within Ranscombe Farm Reserve. Looks settled in and has clearly been present a while, though the ride was only widened in 2009. On gravelly soil, appears to be head material with sand and gravel.
Higham	TQ7171		(1) 17 June 2015 (2) 26 May 2014 (3) Before 1981, after 1970	(1) JS (2) SP, DG (3) Philp (1982)	(1) TQ 7147 7125 (2) TQ 7146 7124, scattered thinly over two open glades. (3) Recorded as TQ77A, but assumed to be TQ7171.
Cranbrook north	TQ7737		6 August 2023	SL	Angley Park, west of Angley Lake, TQ 77027 37224. Top of grassland above lake. Flowering patch in turf with 4 petalled flowers, stalked leaves with 3-4 leaflets, with many fertile achenes.
Ospringe	TQ9759		29 July 2023	DC	TQ 9783 5995, About twenty plants just coming into flower at a site first found by Joyce Pitt 40+ years ago.
Norton Court	TQ96Q		1991-99	EGP	
Ospringe	TQ 9860		(1) 24 June 1980 (2) 29 May 1977 (3) Before 1981, after 1970	(1) FR, HW (2) EGP, FR (3) Philp (1982)	(1) Six plants. (2) Putt Wood, one shoot. (3) Recorded only as TQ96V, but probably same as record (1).
Littlebourne	TR15Y		(1) 1991-99 (2) Before 1981, after 1970	(1) EGP (2) Philp (1982)	May be same as TR1857 below.
Littlebourne	TR1857		8 August 2005	JP	TR 188 578, east of Canterbury, in Trenleypark Wood complex, close to footpath on small acid thin-soiled grassy bank. [There are records for Fishpool Hill, 1949-63.]
Trenleypark Wood, etc.	TR1958		1985	JP	TR 191 585.
Swanton, north of Littlebourne	TR2059		(1) 21 July 2011 (2) 18 July 2000 (3) 12 August 1985	(1) SB (2) JP (3) ACH, RoF	(1) (a) Abundant on dry sandy bank from TR 20311 59055 to TR 20370 59085. (b) 12 plants on sandy grassland at

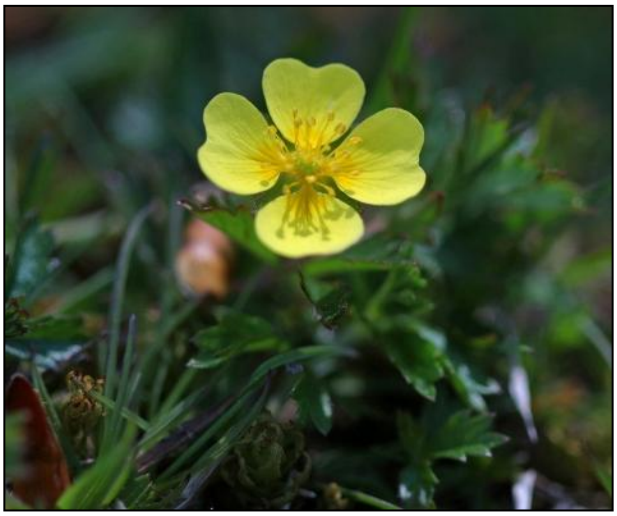
					TR 20330 59019. (2) TR 292 590, Swanton Aerial site. (3) TR 203 591, associated species with *Lotus angustissimus.* [Known at gravel pits here, 1949-63.]
Seaton	TR25J		Before 1981, after 1970	Philp (1982)	

Potentilla erecta (L.) Raeusch. (Tormentil)

vc15 and 16

Rarity / scarcity status

Tormentil is widespread across the British Isles, mostly on acid soils of moors, heaths and mountains. It is by no means rare, but a comparison of its English area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 26% in the likelihood of its being recorded. This may be associated with loss or eutrophication of lowland heath habitat. It is accordingly now classified as **Near Threatened** in England, although its threat status in Great Britain as a whole remains as of 'Least Concern'. In Kent, there is evidence of 38% decline between 1971-80 and 1991-2005, although it still remains neither rare nor scarce. . It is a Kent axiophyte and so is indicative of good habitat.



Brenchley. Photo by David Steere, 8 May 2016

Account

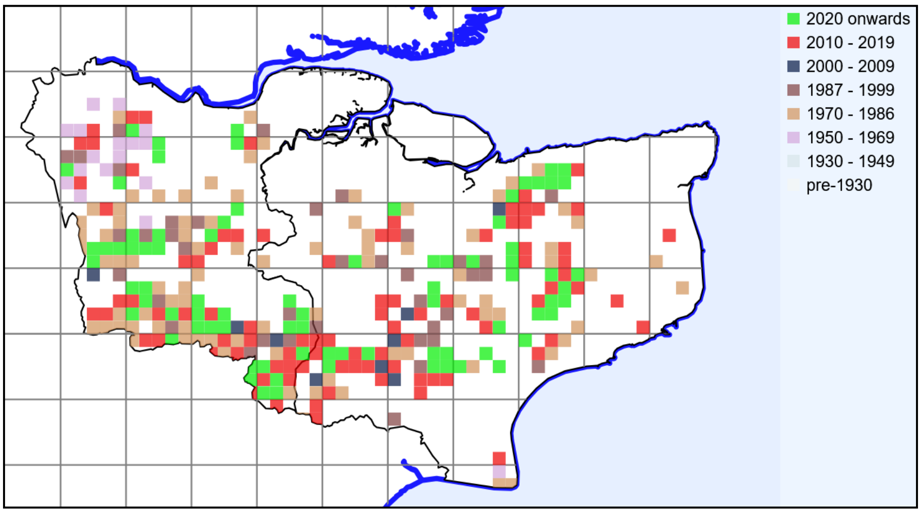
The first Kent record is by Thomas Johnson in his *Descriptio Itineris* (1632), found between Sandwich and Canterbury, probably as he approached the woodlands east of Canterbury, on the sandy Thanet Formation. Hanbury & Marshall (1899) gave no other records, in view of its then common status: it was, they considered, an exceedingly common native of woods, banks, heaths, hedges, but apparently unreported from Thanet (this lack of report still stands). There were, of course, early records from those botanists who did not confine their Floras to the more interesting species (e.g. Forster's *Flora Tonbrigensis*, 1816, gives it as 'In barren pastures and fields, very common), but as unimproved acid grassland was by no means a scarce habitat, as it later became, Tormentil was not held in any regard.

Cobham, habitat. Photo by David Steere, 13 May 2019

Francis Rose treated it as a native of heaths, dry open woods, nearly always on light, acid soils; common inland, but absent from the Hundred of Hoo, Sheppey, and the coastal marshes, except on shingle at Dungeness and on sand dunes at Sandwich. Philp (1982) gives 242 tetrad records, usually on the more acid soils, confirming absence from Hoo, Sheppey, Thanet and coastal north Kent, and with concentrations in the Weald, the Blean, around Ashford and on the Hythe Formation west of Maidstone. However, by the time of the 1991-2005 survey (Philp, 2010), the number of tetrads had declined to 150. The focal areas of distribution remained similar, but very much diluted.

This evidence of decline by 1991 (but not necessarily since) is reinforced by our 2010-24 data, which show 171 tetrads (246 monads).

The pattern of loss is shown by the accompanying map which includes historic tetrad records from the BSBI database. Some of the north westernmost losses from the 1950s/60s may represent urbanisation around Greater London, together with increased tree cover on the commons. Later losses are widespread, perhaps least in the High Weald and the Blean, but clustering heavily in West Kent along the sands of the Folkestone Formation and the Tunbridge Wells Sand Formation.



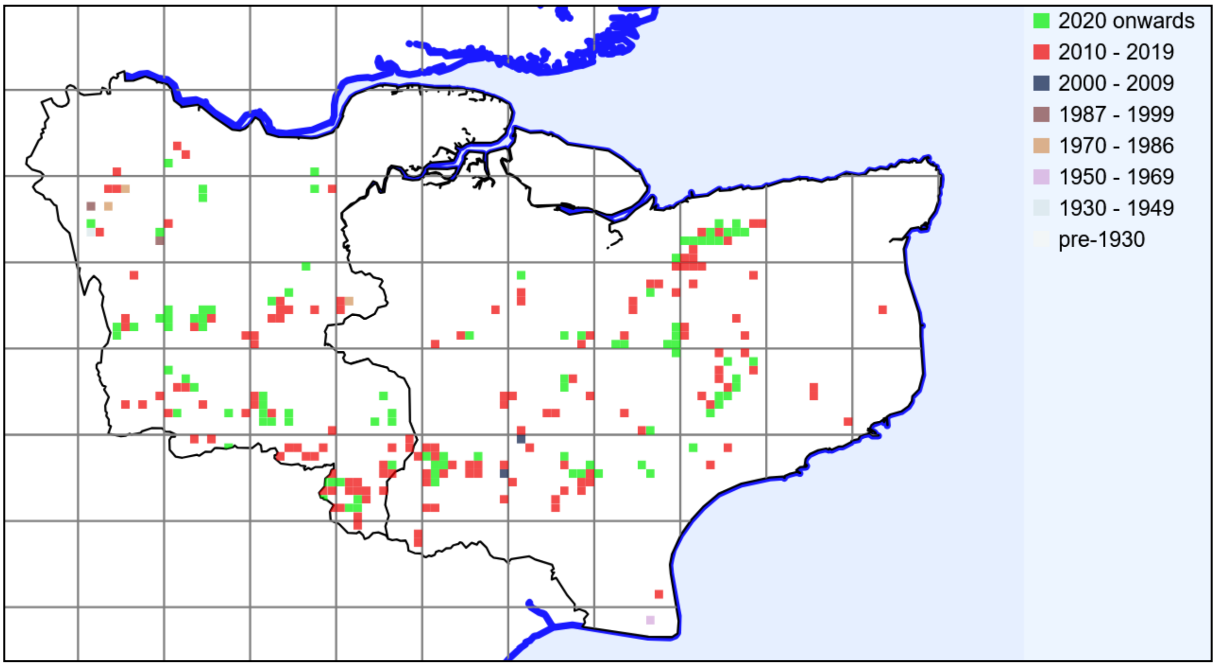
***Potentilla erecta* Kent records to 2024 mapped at tetrad level, from BSBI database.**

If one takes a plant of fairly similar habitats, such as *Calluna vulgaris* (Heather), then this would be expected to show a similar pattern. Heather (see the rare plant register account for that species) declined during between the county surveys of 1971-80 and 1991-2005, with loss of heathland moving towards a position of gain towards the end of that time and afterwards; and indeed 2010-20 tetrad records for Heather were about the same as the total for the 1991-2005 survey (a little less if one discounts metropolitan west Kent records, not included in the latter survey). So, it is likely that similar factors are governing the decline of both species, although it seems more marked with *Potentilla erecta*.

Joyden's Wood. Photo by David Steere,9 August 2020

There appears to be quite a strong relationship between *Potentilla erecta* and woodland, although this will be in open areas: margins and rides. It is generally a plant of acid soils, although there have been exceptions in its soil preferences. Francis Rose in his manuscript *Flora* mentioned the occurrence of *Potentilla erecta* north-west of St Margarets at Cliffe in 1955, on leached soil in chalk grassland, with *Calluna vulgaris* also present. He also noted records by Peter Hall at Preston Hill, Shoreham and the top of Beechy Lees Wood, Kemsing, where Tormentil was growing over clay with flints, which of course modifies the effect of any underlying chalk.

Potentilla erecta has two subspecies in the British Isles: subsp. *erecta* and subsp. *strictissima*. The latter is normally taller, with more extensively and coarsely dentate upper leaves and larger flowers, but does not occur in Kent. Hybrids between *P. erecta* and *P. anglica* (Trailing Tormentil) occur, and also between *P. erecta* and *P. reptans* (Creeping Cinquefoil). The first of these has been frequently recorded in Kent, often in the apparent absence of parents: the second, hardly at all, but is barely distinguishable from the first. If a plant is found to have 4-petalled flowers and it is fertile, but with less than 20 carpels, then this will be *Potentilla erecta*.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Potentilla erecta **Kent records to 2024 mapped at monad level, from BSBI database.**

Prunus cerasus L. (Dwarf Cherry)

vc15 and 16

Rarity / scarcity status

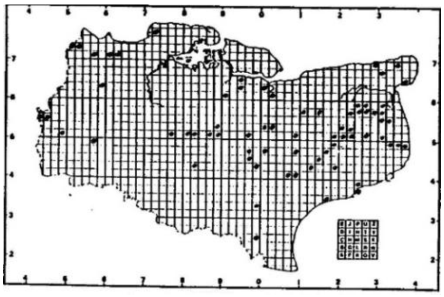
Prunus cerasus is a suckering shrub or small tree, fairly widespread across the British Isles. In Great Britain as a whole its threat status for conservation purpose is regarded as of 'Least Concern', but in England a comparison of its area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 29% in the likelihood of its being recorded, and so it is considered to be **Near Threatened**. The reasons for such an apparent decline are unclear, given that a suckering colony is not easy to destroy; but there may be issues of recording, whether mistakes as between this species and *Prunus avium* (Wild Cherry), or a reluctance to record where more obviously planted. Indeed, *Prunus cerasus* has a long history of planting, but is treated as an archaeophyte, or ancient introduction, so that, with natives, it falls within the scope of this register. In Kent, it is neither rare nor scarce.

Dunkirk. Photo by Lliam Rooney, 12 May 2013

Account

Hanbury & Marshall (1899) refer the first Kent record to Edward Jacob's *Plantae Favershamienses* (1777), but this attribution appears perverse[625]. The earliest literature reference apart from this seems to be H.C. Watson's *Topographical Botany* (1873), which notes *Prunus cerasus* as present in East Kent, but 'Planted?' (this may have been Watson's own sighting near Deal and Ham). Earlier specimens are likely to exist: there is an 1864 gathering in **BM** by J.B. Syme from near Sandwich. Hanbury and Marshall both made and received some 35 records across the county. They considered the cherry to be native (which is not the view taken more recently), a shrub or small tree of woods and hedges; frequent, but appearing to be much rarer than *Prunus avium* and 'In Kent, at any rate, this seems as truly wild as *P. avium*'.

Francis Rose regarded Dwarf Cherry as a rare native or denizen, of hedges and woodland, usually on sandy or loamy non-calcareous soils. Of his records, made by or reported to him, 12 are within the period 1938-1962, although others are clearly contemporary, and they range across the county, from Farnborough in the west to St Margarets at Cliffe in the east. It is difficult to know what to conclude from the 1971-80 records from Philp (1982) as these total 70 tetrads, a quantity not recorded before or after. A distribution map was not published, which may indicate that it was not regarded as being particularly helpful, but the unpublished map is given here.



Prunus cerasus **(Dwarf Cherry) 1971-80**

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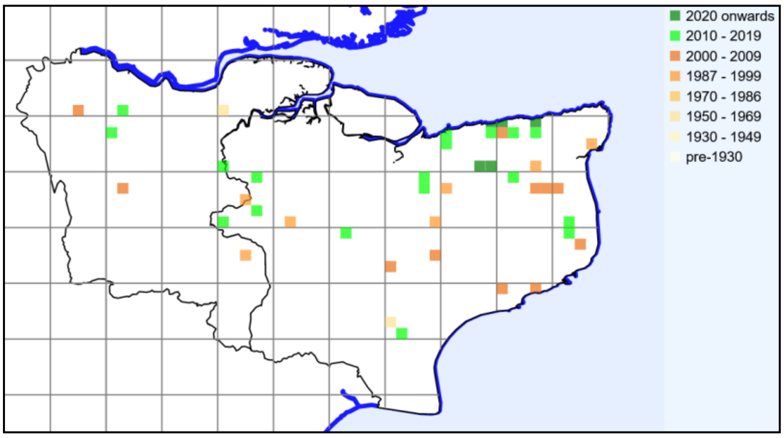
[625] It is said to be because Jacob refers to it as a shrub (which is not apparent) and the fruit is described as red (Cerasus sylvestris fructu rubro). But Jacob refers to his plant as the 'Common wild Cherry', naming it as *Prunus avium* according to Hudson's *Flora Anglica* (1762), which gives Cerasus (etc.) as a synonym. *Prunus avium* of course can have red fruits, and as Jacob described his plant as common in woods and gave no other cherry, it is difficult to avoid the conclusion that this was *Prunus avium* after all. Francis Rose (in his manuscript *Flora*) thought that *P. avium* was more probable.

By contrast, Philp (2010) only gave 18 tetrad records for 1991-2005, describing it as an introduced species of wood borders and hedgerows. Our 2010-24 records are in alignment with this, a total of 23 tetrads (25 monads), although very few of them are the same as those in Philp (2010).



Prunus cerasus **Kent records to 2024 mapped at tetrad level, from BSBI database.**

It should be borne in mind that the accompanying distribution map lacks records from Philp (1982), as they were unpublished prior to this account. All surveys agree in the preponderance of records being in East Kent, and virtually absent from the Weald; but they differ substantially in totals. Given that a suckering tree should not come and go very readily, the burst of records in the 1970s must have a recording explanation. Networked recording can have a different effect from solo recording, and Philp (1982) took records from a range of Kent Field Club recorders, whereas Eric Philp was fully responsible for the data in Philp (2010). However, the 2010-24 finds were also the product of networked recording, and they have not restored the numbers from the 1970s.

Dunkirk. Photo by Lliam Rooney, 19 July 2012

The possible explanations are not new. Kent and Lousley's *Hand List of the Plants of the London Area* (1951-57) called *Prunus cerasus* 'Rare, overlooked or confused with *P. avium*'. Either we have overlooked *Prunus cerasus* both before and after the 1970s; or some of the 1970s recorders confused the species with *P. avium*. Overlooking of course need not imply failure to see and recognise. It may be that it was seen, but no record was taken, because it appeared likely to be of planted origin. Certainly 2010-24 recorders appear to have been sensitive to the status of finds, generally noting if plants formed a hedge, if there were apparent seedlings, if the origin appeared to be bird-sown and if there was suckering.

It is the same species as the Morello Cherry and 'wild' trees are likely to be descended from this.

Dunkirk. Photo by Lliam Rooney, 12 May 2013

Prunus cerasus is distinguishable from *Prunus avium* by its darker green leaves held somewhat erect at maturity, shiny and more or less glabrous below and usually with no more than 8 pairs of secondary veins (11-15 in *P. avium*); by its saucer-to cup-shaped (rather than cup-to bowl-shaped) flowers in clusters of 2-4 (*P. avium* up to 6); by some of its bud-scales at the base of flowers being green and leaf-like; and by its winter bud-scales usually being minutely warty or pitted. It suckers much more than *P. avium* and may form thickets of small trees.

Puccinellia fasciculata (Torr.) E.P. Bicknell (Borrer's Saltmarsh-grass)

vc15 and 16

Rarity / scarcity status

Puccinellia fasciculata is a southern coastal plant, mostly found in Kent, Essex and Suffolk, occasionally inland on salt-treated roads. Its threat status for conservation purposes in both Great Britain as a whole and in England is **Near Threatened**. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of 23% in the likelihood of its being recorded. It is a **nationally scarce** plant and a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006, having been a priority species for the UK Biodiversity Action Plan due to its status as a good indicator of a threatened habitat and its decline with loss of grazing marsh to development and arable conversion. In Kent it is neither rare nor scarce, although there is evidence of decline; but Kent still holds more of this grass than any other county in the British Isles except Essex. It is a Kent axiophyte and so is indicative of good habitat.

From Halling. Photo by Lliam Rooney, 26 June 2013

Account

The first published Kent record seems to be Matthew Cowell's reference (in *A Floral Guide for East Kent, etc.,* 1839, p.67) to the finding, by G.E. Smith, of *Glyceria Borreri* at Dymchurch in 'muddy places by the sea'. This was culled by Cowell from Smith's notes in an interleaved copy dated 1838[626] of Smith's own work, *A catalogue of rare or remarkable phaenogamous plants collected in South Kent* (1829), and Cowell adds later (p.90) Smith's notes on identification characteristics. Hanbury & Marshall(1899) described the grass as a locally plentiful native of muddy salt marshes. Along the north Kent coast, it was known in the nineteenth century at Plumstead Marshes, from Greenhithe to Gravesend, Higham Marshes, the Isle of Grain and in the Medway estuary at Frindsbury and south of Rochester; further east, on Sheppey, and at Faversham Creek and east of Whitstable. On the north east coast, it was known between Ramsgate and Sandwich.

Francis Rose, through his records from the 1940s to 1960s, was aware of a broadly similar coastal distribution in the north and north east. On the south east coast, he found it at St Mary's Bay (which suggests some continuity with G.E. Smith's Dymchurch record) and saw, or had reports, of it by the Royal Military Canal near Hythe, and near Littlestone. It was also reported from Fairfield 1952-62 (where it remained present in 2013), a location which, although inland on Romney Marsh, is still saline from former sea incursions. From the 1971-80 county survey (Philp, 1982) a comparable distribution was identified, amounting to 78 tetrads. It was seen on sea walls, the drier parts of salt-marshes and bare muddy areas near the coast. Rarely, it was seen away from the coast on roadsides, as a consequence of winter road-salting creating new habitat; and a survey in 1982[627] located it in four tetrads along the A21, north and south of Sevenoaks.

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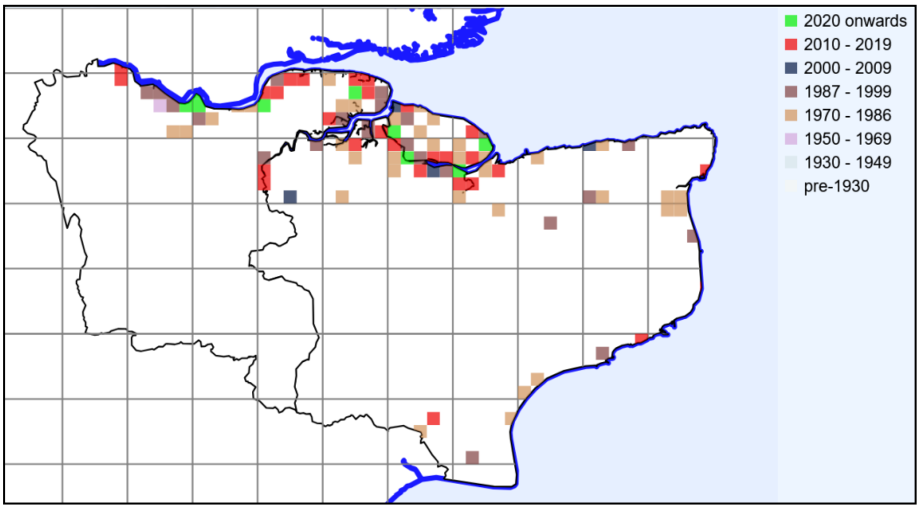
[626] The copy is actually marked by Smith in 1833 as with corrections and additions in 1830, 31, 32, etc., although it is not impossible that some were later, and presumably Cowell borrowed the copy in 1838. Smith's original note refers to *G. dubia*, Doubtful Sweet Grass (a name without any currency), but to this is added later 'now distinguished as *G. Borreri*, Suppl. to E.B. f.', which is a reference to Charles Babington's naming of the grass in *the Supplement to English Botany*, volume 3, published in 1843. Cowell was already using this name in 1839, although Babington had earlier called it *Festuca Borreri* in a paper (Description of a new British Grass) read to the Linnean Society in February 1837 (*Transactions of the Linnean Society* (1837) **17**: 565.

So there may have been some expectation that Babington was going to re-name this grass of which Smith and Cowell were aware. Indeed, the plate in the 1843 publication is dated May 1837, so its associated account may have been held over for volume publication, while subsequent plates and species accounts were prepared; but in any event Smith was clearly in touch with the latest plant developments of the time.

However, in contrast with the 78 tetrads of 1971-80, Philp (2010) gave only 45 tetrads for 1991-2005, an apparent decline of 42%. No reason was assigned for this; its habitats were described as much the same, noting also its occurrence in bare patches near gateways in coastal marshes. Our recent records do not offer any more encouragement as regards the tenure of this species: they amount only to 37 tetrads (46 monads).



***Puccinellia fasciculata* Kent records to 2024 mapped at tetrad level, from BSBI database.**

If the limited number of recent records reflects limitations of survey, rather than increased scarcity, we should be concentrating search in the areas of Dartford, Sheppey, the Swale and between Herne Bay and Margate; there may also be more scope for roadside investigations.

The habitats noted under 2010-24 records mostly relate to saline gravelly, coastal tracks, often just landward of the sea wall. These areas are likely to be winter-wet, open and with limited vegetation generally. We have noted the grass in company with *Puccinellia distans* (Reflexed Saltmarsh-grass), with *Puccinellia rupestris* (Stiff Saltmarsh-grass) and with *Alopecurus bulbosus* (Bulbous Foxtail); the same habitats ought also to produce *Hordeum marinum* (Sea Barley). In saltmarsh, where it might be expected to favour the higher levels, it has been seen with *Tripolium pannonicum* (Sea Aster), *Salicornia ramosissima* (Purple Glasswort) and *Spartina anglica* (Common Cord-grass). It has been seen in grazing marshes, where the ground is bare or cattle-trampled. Such habitats restrict competition by virtue of salinity and trampling.

It is a short-lived perennial, self-pollinating, and it spreads by seed, forming small tufts, sometimes clustered together in patches. It is a glaucous grass, the straw-coloured remains of older leaves often remaining at the base of the tuft, and is characterised by the panicle being stiff and one-sided. The panicle branches do not deflex, as do the lower the lower branches of *P. distans*, and those branches are not bare for much of their length towards the base (as are those of *P. distans*). The lemmas have a very slightly projecting middle nerve and are less than 3mm long (those of *P. rupestris* are ≥3mm).

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[627] Kitchener, G.D. (1983). Maritime plants on inland roadsides of west Kent, *Transactions of the Kent Field Club* **9**: 87-94. The tetrads were not published, but were: TQ45V, TQ55F, TQ55K and TQ54P. It was also found at TQ55G in 1991.

From Halling. Photo by Lliam Rooney, 26 June 2013

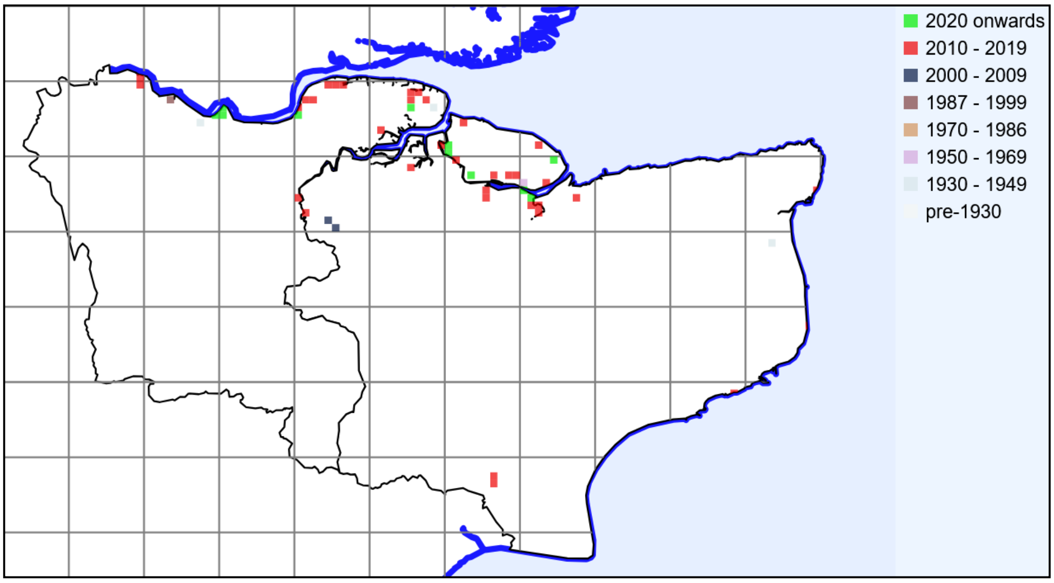
The occasional existence of intermediates between *P. fasciculata* and *P. distans* creates complications. If sterile, with indehiscent anthers, they may be expected to be the hybrid, and this was recorded by Eric Philp on Swanscombe Marshes, TQ67C, in 2006; Philp (2010) refers to this at Dartford Marshes, TQ57N, and Northfleet, TQ57X, as well.

Halling. Photo by Lliam Rooney, 25 June 2013

If fertile, it may be expected to be what has been called *P. pseudodistans*, but which is now generally considered to be a variety of *P. fasciculata*. This variety, which Eric Philp thought to be a fertile form of the hybrid, was more fully recorded when thought to be a species in its own right and has 18 tetrad records in Philp (1982), mainly on the north west Kent coast and in the Medway estuary, but also inland on a roadside and on road sweepings, as well as the inland saline terrain of Fairfield. Philp (1982) described it as very local but sometimes abundant where it does occur. We have no recent records, although unusual *P. fasciculata* plants plants seen at Sheppey in 2024 tended towards '*pseudodistans*' appearance; but the recording infrastructure of the MapMate database does not support it as a separate taxon in any event.

A further variant was named by Marshall in 1894[628] as var. *humilis*, a small prostrate plant with a short and compact inflorescence found on dried-up, or drying, mud close to the (now long vanished) station at Port Victoria, Isle of Grain. Little, if any, attention seems to have been paid to this since.

***Puccinellia fasciculata* Kent records to 2024 mapped at monad level, from BSBI database.**



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[628] Marshall, E.S. (1894). Notes on Kentish plants observed during 1893. *Journal of Botany* **32**: 144-9.

Puccinellia rupestris (With.) Fernald & Weath. (Stiff Saltmarsh-grass)

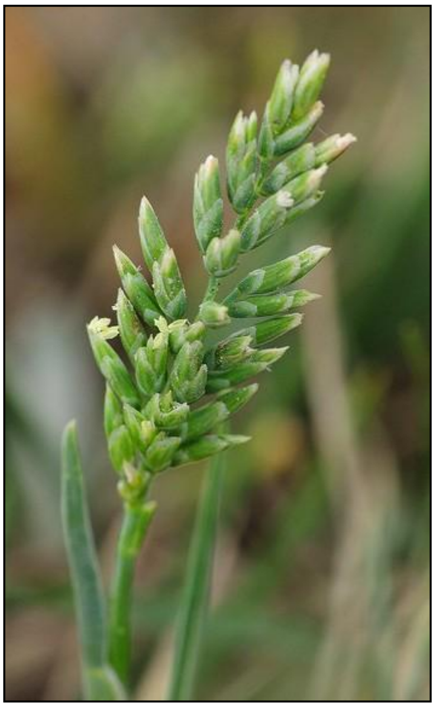
vc15 and 16

Rarity / scarcity status

Puccinellia rupestris is a southern coastal plant, mostly found by the Bristol Channel, the Solent, Kent, Essex and Suffolk. It is a **nationally scarce** plant with a fairly similar distribution and behaviour to *Puccinellia fasciculata*. It is somewhat more frequent than the latter (with 70 hectad records in the British Isles for 2000-19, in comparison with 53 for *P. fasciculata*), and is not so highly regarded for conservation purposes, its threat status being one of 'Least Concern', both in relation to England and to Great Britain as a whole. This status was assessed having regard to its decline in comparing the periods 1930-1969 and 1987-1999; but if records for 1987 onwards were assessed against 'all time' records (so as to include those before 1930), a significant decline of 45% would be shown. This suggests that much of the decline had preceded 1930; but in Kent, there is some evidence of decline since the 1970s. The species is neither rare nor scarce in Kent. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first Kent record appears to be a specimen mentioned by Hanbury & Marshall (1899) as gathered by Professor Henslow at Frindsbury in 1827, and held by Northampton Museum (who have since parted with their collection). Another early record was by Matthew Cowell (*A Floral Guide for East Kent, etc*., 1839), bordering Oare Creek. Hanbury and Marshall treated the grass as a native of muddy shores, banks, salt marshes; local, and apparently absent from the south coast. They listed it from Plumstead, where not uncommon on roadsides and ditch banks in the marshes, along the Thames estuary eastwards to Higham, by the tidal Medway, on Sheppey, from Oare to Herne Bay, and on salt marshes at Thanet. Absence from the south coast was not total: there is an 1839 specimen at Kew collected by John Ball at Dover; and Miss Cobbe noted it at Folkestone Harbour[629]; but these records are exceptional. Francis Rose made or received records in the 1940s-60s corresponding to the historic distribution, fleshing out a little more the presence of the grass along the Hoo peninsula.



Nagden Marshes. Photo by Lliam Rooney, 3 August 2011

Philp (1982) gave *Puccinellia rupestris* as present on sea-walls, and along tracks on clayey soils on the coast from Gravesend to west of Birchington, overall rather local and scarce, with 28 tetrad records. Until this point, it had been very much a coastal plant. Then in 1982[630], six colonies were found on a 12km stretch of the A21 (constructed 1967-71), one of these occupying over 400m of verge. The spread of de-icing salt had clearly created suitable habitat, but the arrival of the grass (considered likely to have been introduced south of Sevenoaks, and to have spread north from there) involved a jump of at least 25km, in a direct line, from the nearest population, in the north Kent saltmarshes. No other populations could then be traced on suitable intervening roads. It seems probable that introduction was via vehicle tyres, although the areas where the grass grows naturally are generally not subject to public vehicular access. These roadside sites were not included in the 1991-2005 survey (Philp, 2010), and indeed a systematic survey of the road has not been carried out again; some aspects of road construction and drainage have since been altered, and survey has become more difficult as traffic intensity has increased considerably.

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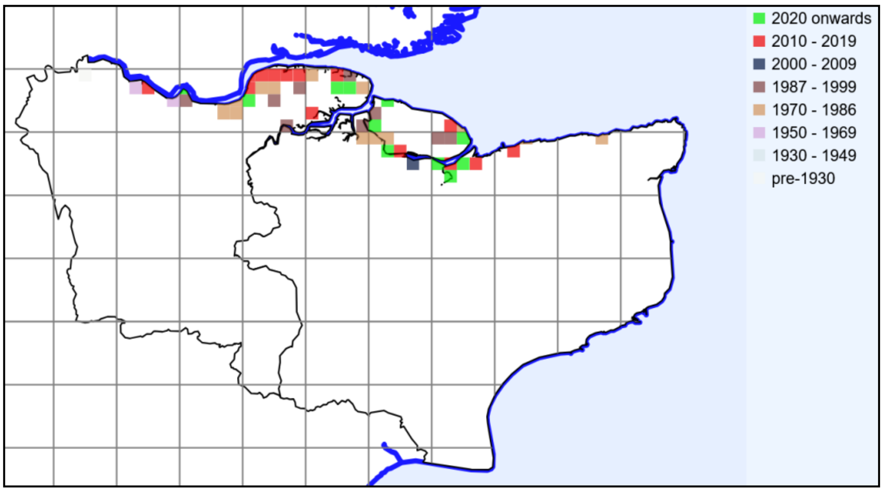
[629] *BEC Report for 1923* (1924), **7(1)**: 223.

[630] Kitchener, G.D. (1983). Maritime plants on inland roadsides of west Kent, *Transactions of the Kent Field Club* **9**: 87-94

However, Philp (2010) did note presence in 22 tetrads, on bare or sparsely vegetated patches along sea walls and tracks over coastal marshes. Ostensibly this is a decline of 21% between the two survey periods, and our more recent records (for 2010-24, totalling 25 tetrads or 29 monads) show no overall change. Although the exact sites differ to a degree, the distribution pattern is very similar. Areas where the 1971-80 survey did better are Gravesend to Higham and the Swale; these may repay further investigation, as habitats remain fairly similar.



Puccinellia rupestris **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Allhallows Marshes. Photo by David Steere, 19 August 2018

Puccinellia rupestris is an annual or biennial, self pollinating and it spreads by seed on open ground, avoiding the competition of closed grassland. Our recent records mostly refer to the open ground of tracks by sea walls: saline, gravelly/shingly and compacted, sometimes seasonally flooded; occasionally on cattle-trampled near field entrances or dikes on the grazing marshes. Gray (1994)[631] mentions its being found on the facing stones of sea walls, resembling *Catapodium marinum* (Sea Fern-grass); we do not recognise any finds of this character but our sea wall records are not explicit enough to confirm Kent occurrences on stonework. The plant is susceptible to being under-recorded, because when it is heavily trampled, with the panicle barely emerging from the upper leaf sheath, there is a temptation to pass on, seeking a more developed specimen to identify. It may also be passed by on the supposition that it is a compact plant of *Poa annua* (Annual Meadow-grass).

Apart from immature plants, identification is reasonably straightforward. It is a low growing plant, the culms usually starting as prostrate, then curving up. The panicles are very dense and one-sided, with short, stiff branches. The lemmas are over 2.8mm, longer than our other *Puccinellia* species except for *Puccinellia*

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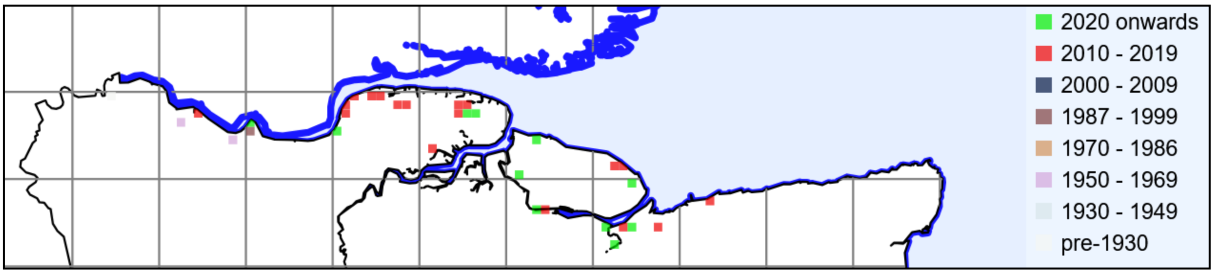
[631] Gray, A.J. (1994). Puccinellia rupestris (With.) Fern & Weath. Stiff saltmarsh-grass. In (eds.)Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce plants in Britain*, JNCC, Peterborough

maritima (Common Saltmarsh-grass), a much larger and patch-forming plant of true saltmarsh, also differentiated by having longer anthers (over 1mm) than *Puccinellia rupestris.*

The hybrid with *Puccinellia distans* (Reflexed Saltmarsh-grass), *P.* x *pannonica*, was found by A.H. Wolley Dod[632] in Plumstead Marshes and on the canal towpath at Higham Marshes. There may have been a perennial population at the latter site, for it was re-found in 1899, 1902 and 1904; there were also records in 1945-47 on the canal bank at Gravesend.

Nagden Marshes. Photo by Lliam Rooney, 3 August 2011

Puccinellia rupestris **Kent records to 2024 mapped at monad level, from BSBI database**



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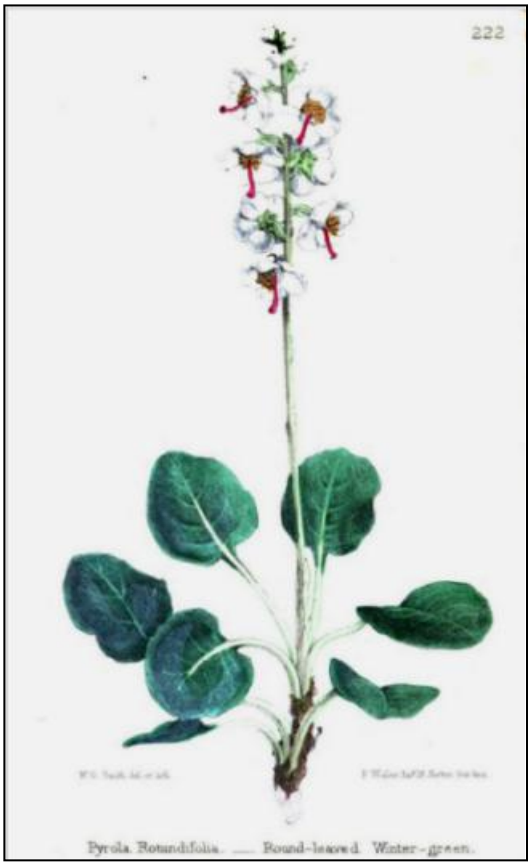
[632] Wolley Dod, A.H. (1895). Glyceria distans var. pseudoprocumbens, n. var. *Journal of Botany* **33**: 84-85.

Pyrola rotundifolia L. (Round-leaved Wintergreen)

vc15 and 16

Rarity / scarcity status

Pyrola rotundifolia has been treated as two subspecies. One, subsp. *maritima*, is primarily western in distribution, and although **nationally scarce** its threat status for conservation purposes is considered to be of 'Least Concern'. The other, subsp. *rotundifolia*, also **nationally scarce**, is sparsely scattered across the British Isles, but hardly in the west except for central Ireland. Its threat status is regarded as **Near Threatened** in Great Britain as a whole; but in England it is considered **Vulnerable** to the risk of extinction. A comparison of its area of occupancy in England over the periods 1930-1969 and 1987-1999 produced a calculated decline of over 30% in the likelihood of its being recorded. The position is complicated by the distinction between the two subspecies being regarded as of doubtful value by Stace (2019, and earlier editions), and this seems to be the case for Kent. The species itself, however, is **scarce** and local in Kent.



From Stowting. Published in *The Wild Flowers of Great Britain* (1866) by R. Hogg & G.W. Johnson, vol. III

Account

The first published Kent record for Round-leaved Wintergreen is in H.C. Watson's *The New Botanist's Guide* (1835) in which he mentions having received a checked catalogue from G.E. Smith, from which the species was noted as in 'Single stations in M[id] and S[outh] Kent'[633]. It is possible to identify these sites, both from Smith's own notes and from the listings in Hanbury & Marshall (1899) as (1) in a wood near Milstead (from which Smith collected a specimen which went to William Borrer's herbarium, now at Kew); and (2) at Coombe Wood, Hawkinge. The latter site may have been the same as a copse near Coombe Farm, where F.J. Hanbury found it to be abundant in 1894; but there were other nineteenth century records in the same general area: Hastingleigh, Stowting and, further north, Petham, Kingston and Shepherdswell. Hanbury and Marshall regarded it as a rare and local native, in woods, chiefly on chalk. The only West Kent record then noted seems at first sight anomalous, at Joyden's Wood, where the geology is sand and gravel, but presumably the record was from the southern end (Chalk Wood), where the ground is more calcareous.

Further East Kent records were made in 1946: at Brook, by Colin Pope; and at Waltham and Chartham, by Miss D. Long[634]. After then, the focus of records appears to move from woods on chalk, to old chalk pits. Philp (1982) refers to *Pyrola rotundifolia* as a plant of woods, old quarries and scrub on chalk, citing records at Nackholt, Yockletts Bank, and two pits: Berengrave near Rainham and Horns Cross Pit. The former pit is now a local nature reserve (the discovery of the *Pyrola* there in 1974 contributing to the site's designation); the latter has been infilled and even at the time of publication of Philp (1982), the locality had been destroyed.

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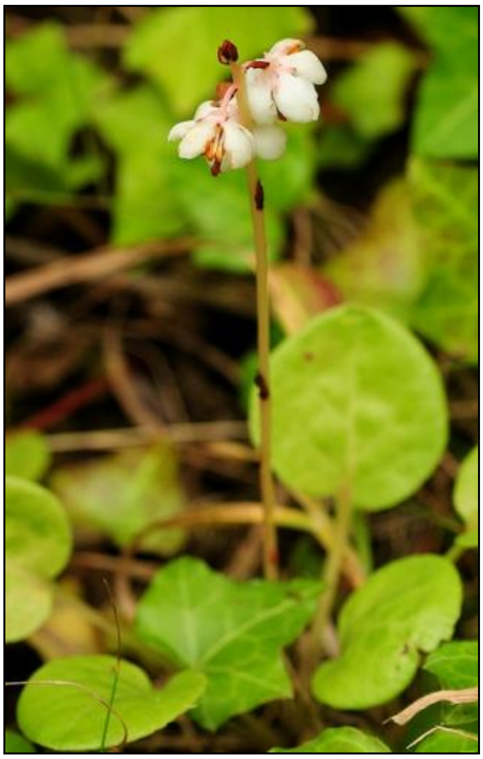
[633] This appears to be a catalogue distinct from Smith's published *Catalogue of rare or remarkable phaenogamous plants, collected in South Kent* (1829), and included all species known to Smith in South Kent 'with some others from different parts of the county, but not falling under his own observations in the south'. Smith's manuscript notes in his own interleaved copy of his published *Catalogue* include a crossed-out entry for *Pyrola rotundifolia* as follows: 'In full flower in July, Coombe Wood. The Reverend A. Barker [?] – In a wood at Milstead. This plant is noticed in a M.S. catalogue of Kentish plants written by Mr. Lindley or Mr Sabine [?] – but without locality'.
Lindley would have been John Lindley (1799-1865).

[634] *BEC Report for 1946-47* (1948), 13: 301.



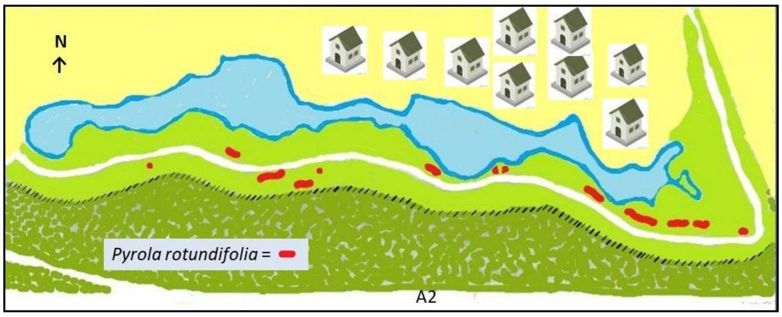
Swanscombe Marshes. Photo by Lliam Rooney, 23 August 2015

The records in Philp (1982) amounted to four tetrads. Similarly, the 1991-2005 survey (Philp, 2010) amounted to four tetrads, but this time, all sites were on old industrial workings. Berengrave pit continued to host plants: it is a former chalk quarry, part of cement works which closed down in 1931. *Pyrola rotundifolia* was also recorded in a disused chalk quarry at Swanscombe, and along a disused chalk quarry railway track, also at Swanscombe. The latter was part of the internal railway system within Swanscombe Cement Works, which declined from 1970 onwards with final shutdown in 1990 (when wagons can still be seen on the line in aerial photographs). The fourth *Pyrola rotundifolia* site was at Beacon Wood Country Park: this was a pit excavated for London Clay, pumped along a pipeline to cement works, but closed for these purposes in 1964 and has been slow to re-vegetate, with little ground cover in many parts. London Clay is somewhat alkaline due to the presence of calcium salts; concentrations of calcium carbonate and phosphate may be found where there are bands of septarian nodules.

All these locations have in common a long period of disuse, a slow colonisation by plants generally, because of the relative absence of soil, and all are highly calcareous, except for Beacon Wood, which is less so. There is also a link with dampness, in that plants tend to grow in the vicinity of seasonally flooded areas, but perched above normal water levels and so only periodically inundated, if at all. Additionally, they tend to grow around the roots of willows (*Salix* spp.). This is particularly evident at Beacon Wood, where plants have been observed in damp mossy areas under *Salix caprea* (Goat Willow). The Swanscombe Marshes railway site is a chalk embankment shaded by *Salix caprea*, draining from higher ground above and with a winter-flooded area below, although there are also plants on the higher ground. Indeed, in 2022 when the higher ground was accessed more fully, it was found that there was a large unsuspected colony numbering tens of thousands of plants, accompanied by a good orchid flora. Smaller colonies in the immediate neighbourhood are best regarded as part of a meta-population, but plants in calcareous scrub about 275m south might better be considered distinct.

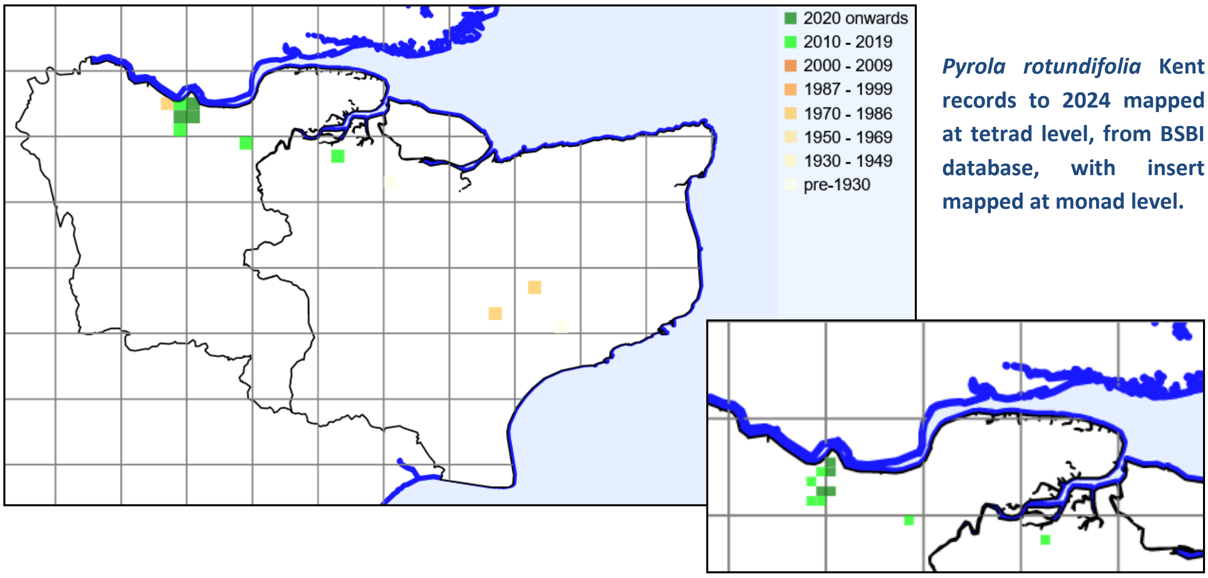
At least five other sites have been known, during or after the 1991-2005 survey, with similar characteristics, although one, possibly two, has been destroyed. Bamber pit, Swanscombe, is an old chalk quarry where *Pyrola* formerly grew on chalk humps at the damp quarry floor with *Epipactis palustris* (Marsh Helleborine) before tipping encroached and affected the pit drainage. Both species apparently disappeared, but *Pyrola* has either been missed or has recolonised, as it is still present (2022). Craylands Gorge is a former minerals railway in deep chalk cuttings, where *Pyrola* has been recorded at the damp base with *Epipactis phyllanthes* (Green-flowered Helleborine) but the site has been severely damaged (by 2021). The third site is a chalk pit at Cuxton which ceased operation in the 1970s and was developed for housing as the Medway Gate estate, c. 2010, with the loss of the *Pyrola*. The fourth site is at Shorne Wood Country Park, which has a similar geology and history to Beacon Wood, having been leased from the 1930s to the 1970s for extraction of London Clay in connection with cement manufacture.

The fifth site is the Eastern Quarry between Bluewater and Ebbsfleet, which had a tunnel connection with Craylands Gorge and is being developed (2013-33) as Ebbsfleet Garden City. In 2000, the north western part of this site comprised a damp quarry floor beginning to scrub over with, inter alia, *Salix caprea*; in association with this, 1,017 flowering spikes of *Pyrola rotundifolia* were counted, and ten years later its population was estimated at 70, 000 plants; much of this has gone, in consequence of preparatory works for development, but David Steere established its continued presence in the southern part of the site in 2019 (the masterplan indicates an intention to leave a lake in this area). Further investigation in 2020 showed that this must be the largest colony in Kent, numbering tens of thousands of plants. Some plants approached subsp. *maritima*, but could not be unequivocally assigned to that taxon. The colony was located south of Castle Hill Lake in the south east corner of the former Eastern Quarry, discontinuously from TQ 60555 72789 to TQ 59709 72865, i.e. for 846m. It is related to a raised trackway which follows the lake contours, below the north-facing chalk cliffs, and grows primarily along the lightly vegetated foot of the trackway where it drops towards ground seasonally flooded, and rarely at the foot of the cliffs; it must also enjoy calcareous drainage passing down the slope. In every case it was associated with *Salix caprea* (Goat Willow) and/or *S. cinerea* (Grey Willow) and/or *S.* x *reichardii* (the hybrid between the two willows). The trackway was at least partly in existence by 1999, fully by 2003, and the lake was formed between 2007 and 2012. So the habitat is relatively new and has rapidly succeeded the loss of the former colonies in the north east corner of the former quarry, which have been destroyed by development.



Pyrola rotundifolia records, October 2020, Eastern Quarry south-eastern lake.

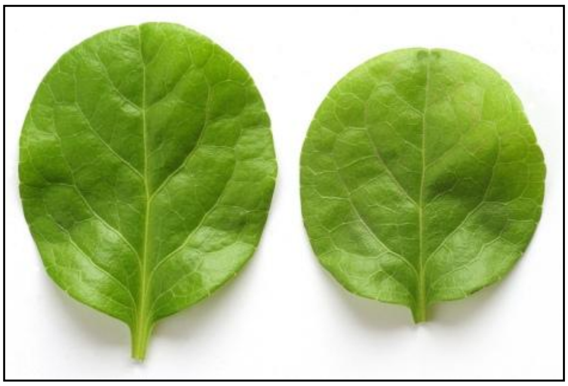
In addition, there is an unconfirmed report of the presence of *Pyrola* at the southern edge of the former chalk pit containing the Bluewater retail development.



Pyrola rotundifolia **Kent records to 2024 mapped at tetrad level, from BSBI database, with insert mapped at monad level.**

So, during the period 2010-24, at least eight sites were known (seven tetrads, or ten monads), in comparison with the four tetrads identified in Philp (2010). However, this apparent expansion may be a passing phase, if prejudiced by development. All recent sites are associated with the former cement industry. Until the 1870s the Thames and Medway had a virtual monopoly of Portland cement manufacture; Swanscombe works were the largest in Britain until 1930; and even by 1970 the north Kent cement industry was the largest in Europe, but has since declined considerably. The result has been the abandonment of many industrial sites, offering opportunities for colonisation by *Pyrola*, but these have been reducing with their development. Also, the remaining former pits have been increasingly secured from any access by palisade fencing, presumably to avoid prejudice to their development potential, and for safety considerations.

Pyrola rotundifolia is a patch-forming perennial, capable of spreading to new sites by seed, which is very small and capable of wind dispersal. It is, however, mycorrhizal, dependent on the presence of fungal associates for germination and establishment. This may explain the association with *Salix caprea* noted in Kent. It may also be relevant to the length of time before these former industrial sites become suitable for *Pyrola*, if the mycorrhizal fungi are to establish first; and it is interesting that two of these sites had associations with rare *Epipactis* species which also have mycorrhizal requirements, although not necessarily the same.



From Swanscombe Marshes. Photo by Lliam Rooney, 24 August 2015

Pyrola rotundifolia subsp. *maritima* and subsp. *rotundifolia* are usually separated on the basis of leaf shape (rarely orbicular in *rotundifolia*; usually orbicular in *maritima*); scale-leaves on stems above true leaves (1-2 in *rotundifolia*; 2-5 in *maritima*); sepals (acute in *rotundifolia*; obtuse in *maritima*); anthers (2.2-2.8mm in *rotundifolia*; 1.9-2.4mm in *maritima*); and style (6-10mm in *rotundifolia*; 4-6mm in *maritima*). However, Philp (2010) found that some plants measured up as *rotundifolia* and others as *maritima*, whilst most plants showed characteristics of both subspecies. So the subspecific distinction may not be particularly helpful in Kent. The possibility that subsp. *maritima* occurred in Kent at all (which is remote from its normal distribution) was raised by John Palmer in relation to plants at Bamber pit first seen in 1976, but measured up in 1984, and falling within the criteria for subsp. *maritima*.[635] He conjectured that these may have arrived as seed from Holland.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Horns Cross Pit, Atlas Stone Co Pit	TQ57S		(1) 1975 (2) 1974 (3) After 1970, before 1981	(1) (2) JRP, JEL (3) Philp (1982)	(1) Atlas Stone Co pit. In plenty; pit being filled in , autumn 1975. (2) Atlas Stone Co Pit, (3) Recorded as subsp. *rotundifolia*. Locality destroyed before 1982.
Beacon Wood Country Park	TQ5871, TQ5971	Country Park	(1) 26 July 2019 (2) 16 May 2015 (3) 28 July 2012 (4) 6 August 2011 (5) 12 July 2011 (6) 12 June 2006 (7) 8 May 2001 (8) 8 September 1996 (9) 1991-98 (10) 8 September 1990	(1) RR (2) KFC meeting (RMB) (3) RR (4) GK (5) RR (6) JP (7) JP (8) KFC / LNHS meeting (9) EGP (10) JP	(1) TQ 589 716, over 100 plants flowering. (2) a few hundred plants, some flowering, in damp area about 18x4m, TQ 5900/1 7165/6. (3) About 280 flowering plants counted, also many non-flowering plants, at TQ 59009 71668. (4) At edge of periodically inundated area on clay, shaded under *Salix caprea* (inter alia), hundreds of plants, between TQ 58995 71658, TQ 59006 71654 and TQ 59004 71670. (5) TQ 588 717, in an area c20m x 10m, 190 flowering spikes in country park plus many non-flowering.

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[635] Palmer, J.R. (1993). *Pyrola rotundifolia* subsp. *maritima* in E England, *BSBI News* **64**: 17.

					(6) TQ 589 718, under sallows at edge of pond. (7) TQ 590 717, large patch, c. 4 x6 metres on barish ground NE of pine tree on central path. Under birch and goat willow. (8) Under willows of pond edges. (9) Recorded as old quarry in Beacon Wood Country Park, TQ57V, and so assumed to be TQ5871 &/or TQ5971. (10) TQ 589 718.
Eastern Quarry	TQ5873		(1) 13 July 2010 (2) 17 August 2000	(1) (2) GK	(1) Reported as at TQ 5880 7395, estimated population 70, 000. (2) 27 populations under *Salix caprea*, totalling 1,017 flowering spikes within the area bounded by TQ 589 736, TQ 586 734 and TQ 585733; survey was not considered fully comprehensive.
Eastern Quarry	TQ5972		(1) 16 October 2020 (2) 26 August 2019	(1) GK (2) DS	(1) In great abundance in TQ6072 and 5972, tens of thousands of plants. Not clearly differentiable to subsp, although one plant assessed with 4 scale leaves, pedicels 4mm, sepals acute (any appearance of obtuseness seems to be tip erosion), style 5.5-6mm, so nearer to but not quite *maritima*. Located south of the lake in the SE corner of the former Eastern Quarry discontinuously from TQ 60555 72789 to TQ 59709 72865, i.e. for 846m. It is related to a raised trackway which follows the lake contours, below the N-facing chalk cliffs, and grows primarily along the lightly vegetated foot of the trackway where it drops towards ground seasonally flooded, rarely at foot of cliffs; it must also enjoy calcareous drainage passing down the slope. In every case it was associated with *Salix caprea* &/or *S. cinerea* &/or *S. x reichardii*. Trackway was at least partly in existence by 1999, fully by 2003, the lake was formed between 2007 and 2012; before then Pyrola was known as abundant in the NE corner of the former quarry (since destroyed). Record locations as follows (and see TQ6072): (a) Foot of N-facing chalk cliffs at TQ 59947 72862 to TQ 59964 72863. (b) South side of raised trackway alongside lake in former Eastern Quarry at (1) TQ 59708 72865 a small open colony, (2) TQ 59985 72856 for 2.5m, (3) TQ 59894 72857 scattered as far as TQ 59921 72861. (c) North side of raised trackway alongside lake in former Eastern Quarry at TQ 59854 72877 to TQ 59842 72878. (2) Not as many plants found here as in the adjacent monad TQ6072; however, at least 50 flowering plants seen and many more blind

					rosettes in damp areas at base of the southern cliff (TQ 5990 7286) and close to the lake (TQ 5974 7290) where access was possible.
Eastern Quarry	TQ6072		(1) 16 October 2020 (2) 26 August 2019	(1) GK (2) DS	(1) South side of raised trackway alongside lake in former Eastern Quarry at (1) T Q60101 72862 to TQ 60117 72853, (2) TQ 60127 72849 to TQ 60152 72841, (3) TQ 60167 72841 to TQ 60253 72850, (4) TQ 60273 72855 a small amount, (5) TQ 60287 72849 to TQ 60298 72843, (6) TQ 60354 72810 a small amount. (2) Very numerous from TQ 604 727 to TQ 600 728 mostly in a damp area at base of the southern cliff with *Phragmites australis* and *Epilobium hirsutum*. A few also found at various spots along the lake shore on the southern bank where accessible. At least 100 flowering plants seen, but many more non flowering leaf rosettes as well.
Greenhithe / Swanscombe	TQ57X		23 July 1999	EGP, PH	Disused chalk quarry at Swanscombe.
Craylands Gorge, etc.	TQ5974		(1) 13 July 2010 (2) 2001 (3) 17 August 2000	(1) DJ (2) JW, JP (3) GK	(1) Craylands Gorge, large patch growing roughly between TQ 5976 7479 and TQ 5987 7478, among ivy and horsetail. Estimated population 20,000. (2) Large colonies growing on damp calcareous floor of Craylands Gorge, [Given grid references TQ 597 744 and TQ 599 745 seem to be rough approximations.] (3) TQ 598 748, 11 populations in gorge, 877 flowering spikes.
Swanscombe, Bamber Pit	TQ6074	SSSI	(1) 25 March 2022 (2) 13 July 2010 (3) 1995 (4) September 1984 (5) 10 July 1976	(1) GK (2) HM (3) ALw (4) JRP (5) JRP	(1) Bamber pit, at TQ 60798 74589 two groups of 4 and 5 plants respectively, and at TQ 60787 74608 twenty plants, in all cases near lowest part of pit on chalk, in ivy near *Populus tremula* and not easily seen at this time of year so there may have been more, close to probable level of flooding in wet winters, but fairly dry now, this was the old location for *Epipactis palustris* (long gone). (2) TQ 6075 7455, estimated 80-100 plants. (3) TQ 608 746, non-flowering. (4) Recorded as subsp. *maritima* (leaves round, stem scales 3-5, calyx teeth short, broad and blunt, anthers < 2mm) and later conf. EGP. (5) Growing with *Epipactis palustris, Dactylorhiza praetermissas, Anacamptis pyramidalis*
Swanscombe Marshes	TQ6075	SSSI	(1) 23 July 2022 (2) 12 June 2022 (3) 5 December 2020 (4) 26 September	(1) GK (2) GK (3) GK (4) DC	(1) TQ 60078 75404, in seasonally damp scrub, a patch 2.5 x 3m amongst *Hedera helix* below *Salix caprea* on calcareous substrate, over 100 flowering spikes, sample

			2017 (5) 23 August 2015 (6) 13 July 2014 (7) 1991-99	(5) KBRG meeting (6) GK (7) EGP	spike with 4 scale leaves above true leaves, pedicels 3mm, style 6mm, leaves near orbicular. (2) (a) Tens of thousands on top of chalk embankment comprising former industrial railway formation, most in shade of willows and birches, fewer where open, embankment varying from c.8m to c.18m across and colony observed (so far as accessible) for some 75m length between TQ 60093 75702 and TQ 60080 75777, accompanied by much *Dactylorhiza fuchsii*. Few plants yet in flower, sample was not helpful in differentiating subspecies, viz. having 3 stem scale leaves, acute sepals, style 8-9mm, pedicels 4.5-5.5mm, anthers 2.2-2.5mm. Site is not as damp as others in NW Kent. (b) numerous plants (hundreds) along a line of small trees, willow and birch, running north-south, near former industrial railway formation, width 1-2m, length c25m, sample grid references TQ 60101 75754, TQ 60100 75729. Western outlier of main colony. (c) TQ 60096 75743, a small colony, c.1 sq metre, in ivy on east side of former industrial railway bank. This is 275m away from very extensive colonies to north. (3) *c*.TQ 6009 7571, east of the known colony associated with disused industrial railway bank (and normally viewed from the footpath below), this colony is a scatter amongst trees on chalk east of the remaining track. (4) TQ 603 754, c.20 plants on shady mossy bank, one still flowering. (5) TQ 60075 75705, on and at foot of shaded west-facing chalk embankment, near damp ground, flowering and flowered plants spread over several metres. (6) TQ60075 75705, on west-facing steep chalk bank (perhaps former industrial light railway formation), dampish at bottom, growing amidst ivy under shade of *Salix caprea* and *Betula pendula*, several loosely associated groups, of 16, 18 and 10 flowering spikes, with plants in leaf being more extensive. (7) Recorded as subsp. *maritim*a originally, but plain *P. rotundifolia* in Philp (2010), where given as along a disused chalk quarry railway track in TQ67C, so assumed to be TQ6075.
Shorne Woods Country Park	TQ6869	SSSI	(1) 14 May 2015 (2) 3 November 2010	(1) IS, SA (2) JP	(1) TQ 68156 69810 to TQ 68150 69821, Shorne Woods Country Park in secondary woodland, mainly birch, over a moss ground layer on London Clay. In winter the water table is at, or slightly above, ground

					level. There are very shallow drainage runs meandering through the woodland, and the Pyrola grows in and along one of these - abundant leaf, and about 5 flowering spikes. (2) Two colonies, under willow in dried up pond area.
Cuxton	TQ7268		(1) 2003 (2) 1995	(1) AC (2) JW, JP	(1) TQ 724 679. (2) TQ 724 680, No. 3 pit. {Since developed as housing estate.]
Berengrave Pit, Rainham	TQ8267	Local nature reserve, part of Riverside Country Park, managed by Medway Council	(1) 13 August 2012 (2) 20 July 2009 (3) 1991-99 (4) 22 July 1997 (5) 5 September 1996 (6) 1 August 1983 (7) After 1970, before 1981	(1) SB (2) SP (3) EGP (4) JS (5) FR (6) FR (7) Philp (1982)	(1) Three plants at TQ 8209 6710. (2) A few plants holding on with increasing ivy cover over the ground. (3) Recorded as TQ86I, old chalk quarry within Berengrave nature reserve. (4) TQ8267 (5) TQ 820 671. (6) TQ 820 671, locally very abundant. (7) Recorded as Berengrave pit, TQ86I.
Nackholt	TR04R		After 1970, before 1981	Philp (1982)	[There is a 1948 record, considered to be at TR 064 425.]
Yockletts Bank	TR14I	SSSI , KWT nature reserve	(1) 24 June 1986 (2) 27 May 1984 (3) After 1970, before 1981	(1) FR (2) FR (2) Philp (1982)	(1) TR1247, rare. (2) TR1247. Overgrown, needs much management. (3) TR14I.

Pyrus pyraster (L.) Burgsd. (Wild Pear)

vc15 and 16

Rarity / scarcity status

There are pears (*Pyrus* sp.) growing in the wild in Kent and across the British Isles, but setting aside *Pyrus cordata* (Plymouth Pear) which grows in Devon and Cornwall, there is unlikely to be any native pear, and pear's status is at best an archaeophyte-denizen (an ancient introduction behaving as a native). Pears with the characteristics of *Pyrus pyraster* appear to be the 'wildest', but the distinction between *Pyrus pyraster* (Wild Pear) and *Pyrus communis* (Pear, the edible pear to which escapes from cultivation are usually assigned) was not made in mainstream botanical recording until the first edition of Clive Stace's *New Flora of the British Isles* (1991)[636]. There is, however, a good case for not separating *P. pyraster* and *P. communis*, but treating them (as in Sell & Murrell, 2014)[637] as one species, *P. communis*. Sell & Murrell (2014) divide up the one species into: subsp. *communis* (as equivalent to *P. pyraster*); subsp. *achras* (the perry pear); and subsp. *sativa* (the edible pear). This at least offers recorders the ability to record pears as *P. communis* where there is uncertainty about whether they fit *P. pyraster* (although this is generally done by recording as pear in the wide sense, viz. *P.communis* sensu lato).

The upshot of this is that: pears in the wild are not necessarily the same as Wild Pears; and pear records before 1991 may or may not be of *Pyrus pyraster*. A threat status for conservation purposes has not been assigned to *P. pyraster*, although for England, that of *P. communis sensu lato* is regarded as of 'Least Concern'. The number of records assigned to *P. pyraster* in Kent indicates that we should regard the species as **scarce** in the county, if present.

Account

As for the early presence of pear in Kent, Godwin (1975)[638] refers to archaeological evidence of pear charcoal in Kent, from the Iron Age Hill Fort at Bigbury Camp near Harbledown and from Canterbury; but this must be uncertain, because determinations of *Pyrus* might have followed the older use of this generic name, which formerly included *Sorbus* species. Better evidence is provided by the citation of Perie (a holding by Ansfrid the Clerk) as a place-name in the Domesday Book for Perrywood, and the combination of both perry (from the Old English *peru*, pear, or *pirige*, a pear-tree) and wood (from the Old English *wudu*, wood) in a 1485 mention of Perywode. There exist other pear-related Kent place-names, a list of which has been compiled by Maki (2024)[639] and which include the identification of another Perie held by Ansfrid together with Perry Court, also broadly south of Faversham.

Documented pear introduction to Kent goes at least back to 1533 when 'Pear grafts of diverse sorts' were imported by Richard Harrys to Teynham for growth in orchards.

The first documented Kent record of pear in the wild was by Edward Jacob in his *Plantae Favershamienses* (1777) where he mentioned Wild Pear Tree as very uncommon, '*In the Wood leading from* Keneways *to* Wilderton'; this looks as though it would have been Wilderton Wood, south of Painter's Forstal. It is suggestive that Jacob's woodland record is, as with Perry Court and Perry Wood, very broadly south of Faversham, so that the area as a whole has a longstanding association with pears.

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[636] There appears to be a level of distinction between *P. pyraster* and *P. communis* cultivars sustainable on DNA analysis, e.g Łukasz Wolko, Ł., Antkowiak, W., Lenartowicz, E. & Bocianowsk, J. (2010). Genetic diversity of European pear cultivars (*Pyrus communis* L.) and wild pear (*Pyrus pyraster* (L.) Burgsd.) inferred from microsatellite markers analysis. *Genetic Resources and Crop Evolution* **57**: 801-806.

[637] Sell, P. & Murrell, G. (2014). *Flora of Great Britain and Ireland,* vol.2, CUP, Cambridge.

[638] Godwin, H. (1975). *History of the British Flora*, 2nd edition, CUP, Cambridge.

[639] Maki, E. (2024). Pear-based place names: a note on Perry Wood. *Archaeologia Cantiana* **145**: 328-337.

From the botanical nomenclature of the time, however, we cannot tell whether Jacob's record would now have keyed out to *P. pyraster*. Similarly as regards other records listed by Hanbury & Marshall (1899) under *P. communis*, which they regarded as an uncommon denizen or alien of woods and hedges, probably always bird-sown

Francis Rose considered Wild Pear (as *P. communis*) to be probably introduced, but possibly native. He saw it in 1946 at Keston Common (also known here by Ted Lousley in 1922) where it was attributed to var. *pyraster*. Intriguingly, he noted with David McClintock in 1958, a pear resembling *Pyrus cordata* in a roadside copse at Palstre Court, 1½ miles west of Wittersham. His manuscript *Flora* contains 16 locations for Wild Pear, most in metropolitan north west Kent and in the Weald.

Philp (1982) gave *P. pyraster* as native in woods and scrub, very rare with five tetrad records[640], but perhaps confused with *P. communis*. Clearly a proper attempt was being made to differentiate, given that the main British Flora of the time[641] did not separate out *P. pyraster*. Philp (2010) stated that the few plants seen, in hedgerows and woodland edge, had a good claim to be regarded as native. They amounted to three tetrad records only, near Bough Beech TQ44T, Four Elms TQ44U and Ightham TQ55X: all differing from the Philp (1982) finds. A record not included in this set was in 2000, by John Palmer at New Barns, Swanley, TQ 511 699 (leaves lustrous above, fruits globular, white-speckled). Also, outside the scope of Philp (1982 & 2010), because in the London Borough of Bromley, is a record of a mature tree from Summerhouse Hill Wood, Beckenham Place Park, TQ 383 703 (1992-95) an area of ancient woodland with many tree plantings.

Since 2010, there have been two claimed sightings for *P. pyraster* in Kent: Four Elms (TQ 47614 48989, the original tree accepted by Eric Philp for Philp, 2010, plus a second bush nearby) in 2014; and Orlestone Forest (TQ 97870 35036) in 2014. A fuller study has been made of these and other plants by Stephen Lemon (**Problems with Pyrus in Kent)** and extracts from this study are included below.

> During May 2014 I found a Pear tree west of Hever (TQ 465 455). This offered the opportunity of a comparison with another Pear tree just east of Winkhurst Green (TQ 498 494). Subsequently I was also provided with details of another two Pear trees, one at Orlestone Forest (TQ 978 350) and another at Four Elms (TQ 476 489). Pear records submitted to the Kent Botanical Recording Group are for both *Pyrus pyraster* (Wild Pear) and *Pyrus communis* (Pear). Fewer records exist for *P. pyraster*, to such an extent that it has been placed in the Kent Rare Plant Register. Two further species of Pear are known in the British Isles, *Pyrus cordata* (Plymouth Pear) and *Pyrus salicifolia* (Willow-leaved Pear), but so far neither has been recorded wild in Kent and the four Pear trees examined were not these two species.
>
> Stace (2010) and Poland & Clemen (2009)[642] take a more or less consistent approach to identification of Pears with both recognising *P. communis* and *P. pyraster* as separate species. This has been standard for British botanists since the first edition of Clive Stace's *New Flora of the British Isles* (1991); previously the various editions of the *Flora of the British Isles* had lumped both together under one name, whether *P. pyraster* or *P. communis*. More recently the publication of Sell & Murrell (2014) has provided an alternative approach. Sell & Murrell recognise *P. communis* as a species, but not *P. pyraster*. *P. pyraster* is re-classified as one of three subspecies of *P. communis* and re-named *Pyrus communis* subspecies *communis* (Wild Pear). A remark in Stace that *P. pyraster* and *P. communis* are '*...perhaps not specifically distinct.'*, gives some justification to Sell & Murrell seeking an alternative approach. In addition Sell & Murrell provide a way of identifying their subspecies without fruit by reference to how soon leaf hairs are lost. They also recognise another form of Pear: *Pyrus communis* subspecies *achras* (Perry Pear), which has fruit of a similar size to *Pyrus communis* subsp. *communis*. I have attempted to apply the Sell & Murrell approach to my assessment here. The following key to the *P. communis* subspecies is based on detail taken from Sell & Murrell:

---

[640] Not identified in Philp (1982), but they were: TQ56X, 57F, 57Q, 57V and 67F; so all West Kent. The TQ57F, TQ67F and TQ57Q are John Palmer's, the last of these made in company with Eric Philp and Peter Hall.

[641] Clapham, A.R., Tutin, T.G. & Warburg, E.F. (1962) *Flora of the British Isles*, 2nd edition, CUP, Cambridge.

[642] Poland, J. & Clement, E.J. (2009). *The Vegetative Key to the British Flora*, John Poland/Botanical Society of the British Isles, Totton.

1. Leaves soon glabrous after opening or nearly so; spines usually present on spur shoots; fruits 1.3-3.5 x 1.8-3.5 cm, globose or turbinate, often with conspicuous lenticels, hard and gritty to taste

Pyrus communis **subspecies** ***communis*** **(Wild Pear)**

1. Leaves woolly beneath well into the summer **2.**

  2. Leaves densely hairy beneath throughout the summer; spines sometimes present on spur shoots; fruits 2.5-3.0 x 2.5-3.0 cm, globose or turbinate, hard, gritty and sour to taste

  Pyrus communis **subspecies** ***achras*** **(Perry Pear)**

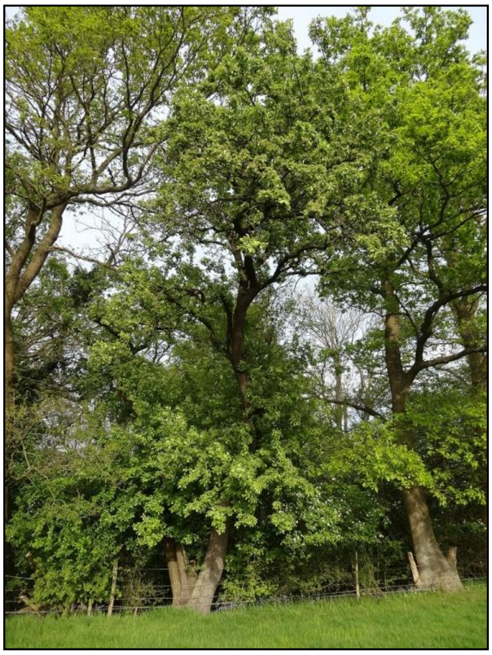
  2. Leaves densely hairy at first but slowly becoming glabrous through the summer; spines not usually present on spur shoots; fruits (5-)6-16 x 4-12 cm, subglobose, turbinate, pyriform or oblong, soft and sweet to taste

  Pyrus communis **subspecies** ***sativa*** **(Edible Pear)**

Hever and Winkhurst Pears

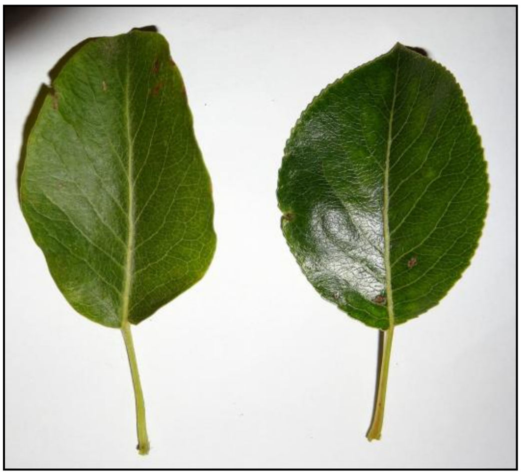
Both the Hever and Winkhurst Pears grow within farmed countryside, not immediately next to human habitation. Historic imagery from Google Earth back to the 1940s does not show orchards in the fields adjacent to either and earlier Ordnance Survey maps back this up. Neither displays obvious signs of a planted origin. The Hever Pear is a large coppiced tree at the edge of a shaw with an open canopy of three tall trunks, presumably coppiced with the rest of shaw over fifty years ago. In contrast the Winkhurst Pear is a standard tree in a hedge dividing fields, with a short trunk and a dense wide crown. The Winkhurst Pear becomes visible in its hedge on Google Earth's historic imagery from 1960.

Winkhurst Pear



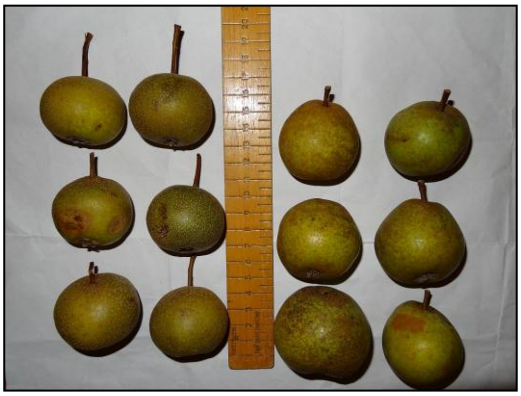
Hever Pear (Photos by Stephen Lemon)

The Hever Pear has pale green leaves with a dull shine, the edge of the leaf entire and glabrous brown buds. The Winkhurst Pear has dark green leaves with a bright shine, a crenate/serrate leaf edge and hairy brown buds. When visited in April 2015 the newly emerged leaves on both trees were found to have a fairly dense coating of hairs on the underside of the leaf. Both trees had spiny growth on their non-fruit bearing lower branches; much less on the Hever Pear and probably encouraged by cattle grazing on the Winkhurst tree.



Hever Pear (left) and Winkhurst Pear (right).
Photo by Stephen Lemon, July 2014.

The importance of selecting ripe fruit was demonstrated when considering the size, shape, texture and taste, as these factors changed right up to the time of ripening. A selection of ripe fruit collected from both Pears was between 4 and 5 cm in length, although a single fruit of just over 5 cm was found for the Hever Pear. Neither Pear could be described as having "pear" shaped fruit. The Winkhurst Pear's fruit had an even spread of tiny white lenticels across the skin and was uniformly globose when first examined in July 2014, widening by the time it ripened in September to become more apple shaped. The pedicels of the Winkhurst Pear were long; just over 3 cm which made them stand out in the early stages of development although this was less obvious at maturity.

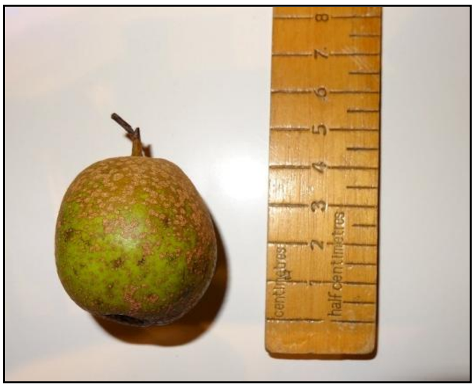


Ripe fruit of Winkhurst Pear (left of ruler)
and Hever Pear (right of ruler).
Photo by Stephen Lemon, 7 September 2014.

The Hever Pear had a more turbinate shaped fruit with a pedicel half the size of the Winkhurst Pear. Both Pears had sweet tasting fruit with firm rather than hard flesh when ripened in early September 2014 but were deceptively sour and hard before ripening. The Winkhurst Pear had the most pleasant tasting fruit and made excellent jam!

Orlestone Pear

In early October 2014 Owen Leyshon provided me with the fruit from another Pear tree on the north side of Longrope Wood at Orlestone Forest. He confirmed that this Pear tree grows a short distance into the woodland from the road and is very tall with a bifurcated trunk and spiny growth. Its fruit resembles the shape of the Hever Pear and like the Hever and Winkhurst Pears is between 4 and 5 cm in length. In contrast its fruit was harder when ripe, but still had a sweet taste.



Ripe fruit of Orlestone Pear.
Photo by Stephen Lemon, 7 October 2014.

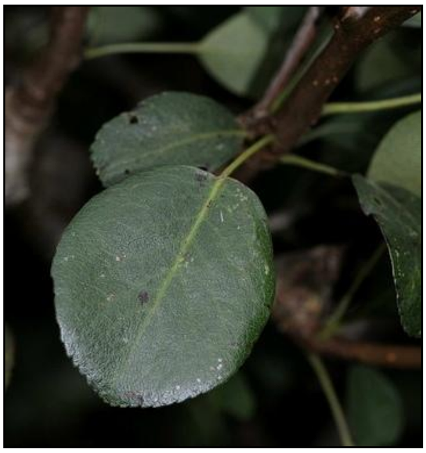
Summary of the Hever, Winkhurst and Orlestone Pears

All three Pears described have the sweet tasting ripe fruit of *P. communis* subsp. *sativa*. However they display an intermediate fruit length, below the lower range of *P. communis* subsp. *sativa* and above the upper range of *P. communis* subsp. *communis*. The densely hairy underside to the leaves of the Hever and Winkhurst trees brings them closer to *P. communis* subsp. *sativa*. The Hever tree's virtual lack of spines suggests that it is closer still to *P. communis* subsp. *sativa*. In contrast the Winkhurst Pear's more obvious spines and globose fruit with lenticels brings it back nearer to *P. communis* subsp. *communis*. The Orlestone Pear's hard ripe fruit and spiny growth also suggests it has some affinity with *P. communis* subsp. *communis*.

The most obvious point from the above is the mix of features displayed by all three trees. With these examples one wonders how far the three Sell & Murrell *P. communis* subspecies hold true in the farmed landscape of Kent? A hybrid origin for these Pears might account for their mixed characters. The *Hybrid Flora of the British Isles* (Stace, Preston & Pearman, 2015) refers to many wild Pears being difficult to place and the suspicion that hybridisation is the cause. However it also refers to the lack of studies into *Pyrus* hybrids with no formal records and an unproven existence in the British Isles. In light of this the most appropriate description for these Pears at present seems to be *P. communis sensu lato* (so as not to assign any subspecific name, as used by Sell & Murrell). It is worth noting that the same conclusion was reached when assessing these Pears using Stace (2010) and Poland & Clement (2009) (so as not to commit to the name *P. pyraster*).

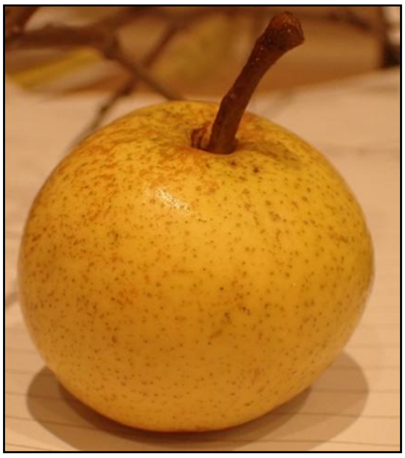
Four Elms Pear

Lliam Rooney provided the location of a Pear within a roadside hedge near Four Elms that was originally discovered by Eric Philp and was one of the three *P. pyraster* records given in (Philp, 2010). Google Earth's historic imagery indicates the hedge is all that now remains of a shaw that was grubbed out after 1960. There are some large coppice stools within the hedge from a variety of tree species, but not in the section with the Pear. On visiting the site, a second Pear was located five metres from the original. This all suggests the section of hedge with the Pears did not originate from the woodland shaw, but there were no obvious indications of it having been planted. The Pears are both no more than large bushes that lack fruit due to annual cutting, but have substantial spiny growth that is probably encouraged by the annual cutting. The leaves have a similar crenate edge to the Winkhurst Pear but are smaller and almost spherical in shape. Significantly the leaves were glabrous on the upper surface and almost glabrous on the underside when examined in April 2015, with just a few hairs along the veins and leaf edge. In lieu of ripe fruit, the prolific spiny growth and the almost hairless leaves soon after opening seem sufficient to place this Pear as *P. communis* subsp. *communis.*



Four Elms. Photo by Lliam Rooney, 28 August 2008

So far as concerns subsequent wild(-ish) pear finds, a mature tree in a hedgerow at Elderden, Chart Sutton, TQ 7893 4695, was reported by Lou Carpenter in 2022: it was suckering somewhat and had two main leaders. The tree was very spiny and the leaves, when examined in November, were glabrous on both surfaces, dull green and crenate/serrate. The fruit was globose, somewhat apple-shaped, with lenticels. Although these features point towards subsp. *communis*, the fruits (at 4.0 x 4.5cm) were large for that subspecies and, once half-rotted, were sweet to taste, albeit gritty (which points towards subsp. *sativa*). So this tree does not fit well the subspecific division adopted by Sell & Murrell. While adjoining a pear orchard, it was considered to be at least 60 years old and exceeding the age of that orchard. However, this is an area which has seen much fruit growing and while the field boundaries here are the same as in the 1868 ordnance survey, orchard establishment in the general vicinity was increasing by the 1895-96 ordnance survey revision.



Elderden. Photo by Lou Carpenter, 16 November 2022

Stephen Lemon's thorough assessment means that a degree of doubt must attach to Kent records of *P. pyraster*, particularly as regards those examined by him and showing a mix of characters. He also found no evidence of mature fruit of the size and sourness which might indicate that *P. communis* subsp. *achras* is present in the wild in Kent. Not all 'wild' pears key out fully into the Sell & Murrell subspecies, but if they are taken as originating from the seeds of orchard/planted varieties, rather than other wild trees, this may account for the wide variation in leaf and fruit features and would mean that the number of 'new' wild trees being reported in Kent should be falling now that commercial pear orchards are in lower numbers.

Kent Rare Plant Register
Species accounts Part Q & R

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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The register formerly included the following species account which may now be found at **Appendix A** of the register, https://bsbi.org/kent

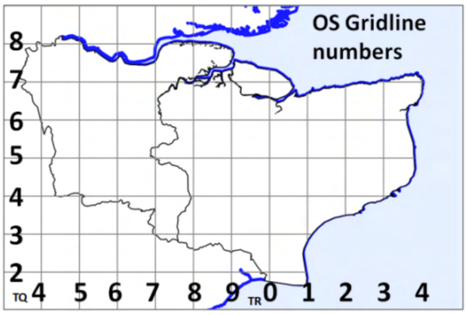
***Rhinanthus angustifolius* (Greater Yellow-rattle)**

Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

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ACJ Clive Jermy
AJ Ade Jupp
AL Alex Lockton
AW Tony Witts
BB Ben Benatt
BG B. Goldsmith
BL Brian Laney
BS Barry Stewart
CC Chris Cook
CEC Carter Ecological Consultants
CO Colin Osborne
CW Caroline Ware
DC Danny Chesterman
DG Doug Grant
DM Daphne Mills
DP D. Popplewell
EGP Eric Philp
ES, E. Shilland
FB F. Baker
FJR Fred Rumsey
FK Francis Koppschall
GJ Geoff Joyce
GK Geoffrey Kitchener
GMH G.M. Hemington
HS Heather Silk
JB John Badmin
JBev Jim Bevan
JBr J. Brattle
JC Juliet Cairns
JE John Edgington
JL Jackie Langton
JP Joyce Pitt
JPu John Puckett
JR James Rowland
JRP John Palmer
JS Judith Shorter
JW Jo Weightman
KBRG Kent Botanical Recording Group
LM Lesley Mason
LR Lliam Rooney
MB Mike Bax
MJ Michael Jones
MP M. Pickard
MR Mike Robinson
NB Nick Bertrand
NFS Nick Stewart
OL Owen Leyshon
PH Peter Heathcote
RL Richard Lansdown
RMa Roger Maskew
RMB Rodney Burton
RoF Rosemary FitzGerald
RS Rebekah Smith
SA S. Aslett
SB Sue Buckingham
SBRS Sussex Botanical Recording Society
SC Steve Coates
SL Stephen Lemon
SP Sue Poyser
TI Tim Inskipp
TN Tony Nuthall
TW Tim Wilkins

Other abbreviations and references:

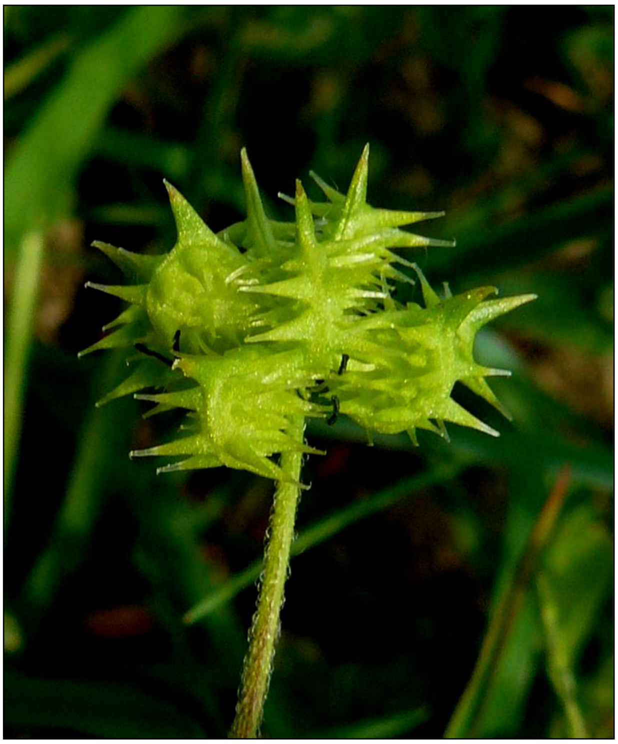
BM =Natural History Museum herbarium	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MOD = Ministry of Defence	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
Hanbury & Marshall (1899) refers to their *Flora of Kent*	MNE = Maidstone Museum herbarium	SLBI = South London Botanical Institute herbarium

Ranunculus arvensis L. (Corn Buttercup)

vc15 and 16

Rarity / scarcity status

Ranunculus arvensis is an archaeophyte, or ancient introduction which used to be widespread as a cornfield weed, but is now **nationally rare or scarce** and considered to be **Critically Endangered** in Great Britain as a whole. In England, it is considered to be **Endangered.** This risk assessment is based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 69% and its area of occupancy had declined so that there was a 77% reduction in the likelihood of recording the species. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. In Kent, it apparently declined by 93% between 1971-80 and 1991-2005, and is currently very **rare**. As a Kent axiophyte, it is indicative of good habitat.



Mersham. Photo by Heather Silk, 13 May 2011

Account

The first Kent record for Corn Buttercup is by Thomas Johnson in his *Descriptio Itineris* (1632), in travelling from Sandwich to Canterbury. It is listed immediately after records for *Spergula arvensis* (Corn Spurrey) and *Spergularia rubra* (Sand Spurrey), which suggests that he had reached sandy arable land, probably the sands of the Thanet Formation by the road west of Ash. Early botanists do not pay much attention to it in the county because of its ubiquity: but amongst those Flora writers who sought to cover all species, Edward Jacob (*Plantae Favershamienses*, 1777) refers to it as '*In Corn fields – very common*', echoed exactly by Thomas Forster (*Flora Tonbrigensis*, 1816) – 'In cornfields, very common'. Hanbury & Marshall (1899) were comparatively appreciative: 'The finely cut leaves, sulphur-yellow flowers, and handsome, prickly fruit mark it off widely from our other British species'. They regarded it as a plant of cultivated fields, usually among corn, showing a decided preference for chalk and clay, and common, recorded from every botanical district in the county except Thanet 'where no doubt it also occurs'[643]. It is a little surprising, however, that the near-contemporaneous *Woolwich Surveys* (1909) thought Corn Buttercup to be somewhat rare in north west Kent, but occasionally found established in arable fields.

Corn Buttercup continued to be recorded without any particularly discernible distribution pattern, although there are a lot of records in the 1950s, with preponderance in East Kent, and Philp (1982) gives 15 tetrad records: five of these on Sheppey, and the rest scattered across the county, other than in the south east. Its status was then assessed as long established as a cornfield weed but having become rare, found in cultivated fields or disturbed waste ground. After then, it virtually disappeared. Philp (2010) found it during the period 1991-2005 only in a field opposite Marden Meadow (where known at least since 1985). There have been just three sites recorded since 2010, including the Marden site.

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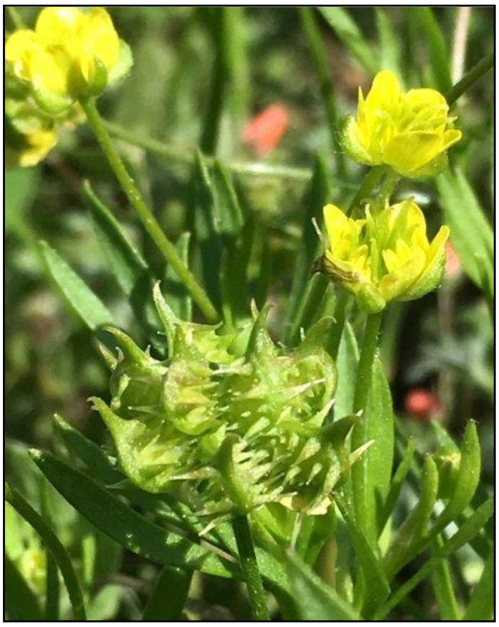
[643] This seems to be the case, as it is listed by George Pittock in his *Flora of Thanet* (1903), albeit without any detail. However, the copy of Hanbury & Marshall (1899) which was acquired and annotated by him (now in the possession of John Badmin) contains a note against *Ranunculus arvensis*: 'Nash Court 1901 – Hewett' (this was F. Hewett of Margate).



Swift's Green. Photo by Owen Leyshon, 14 June 2019

Of these three sites, only Marden is an arable margin. At Mersham, it was (in 2011) by a public footpath through a hayfield, so in effect it was a marginal site, through the disturbance of footpath access. At Swift's Green (in 2019) it was in a grass ley and so with a degree of openness which enabled this and other arable weeds to grow.

The loss of this species generally in Great Britain appears largely attributable to the effectiveness of agricultural herbicides developed in and since the 1940s and 1950s. It is an annual, germinating principally in autumn and so almost entirely restricted to winter-sown crops. Smith (1994)[644] refers to Corn Buttercup's buried fruits remaining viable for many years, although an experiment found that over 60% of seed germinated within five months of sowing, which does not suggest that a great deal gets left for the seed bank. In a Spanish context, Torra et al (2018)[645] found that *Ranunculus arvensis* had a comparatively low persistence index (a proxy for seed bank persistence). Accordingly, one interpretation of the rapid falling-off of records after the 1970s might be that adverse agricultural conditions could no longer be overcome by adventitious germination from the seed-bank: this seed-bank had simply become exhausted.

Marden, habitat. Photo by Sue Buckingham, 20 May 2012

Modern sources of introduction are with wild flower amenity sowings (such as 1994 and 2002 sightings at South Norwood Country Park) or with wild bird seed (as at Kemsing in 1982).

Ranunculus arvensis is an upright annual, with deeply divided middle and upper leaves. The sepals are spreading, not reflexed as in *Ranunculus parviflorus* (Small-flowered Buttercup). The achenes are very distinctive, usually with strong spines (*R. parviflorus* has achenes with a tubercular surface bearing only minute spines.

Historic distribution, where recorded at least to tetrad level, is included in the tetrad map below. This shows the widespread, but scattered, occurrences of the 1970s. The following data table excludes introductions and the Philp (1982) records where they are bare tetrad numbers without further detail. Those tetrads were:

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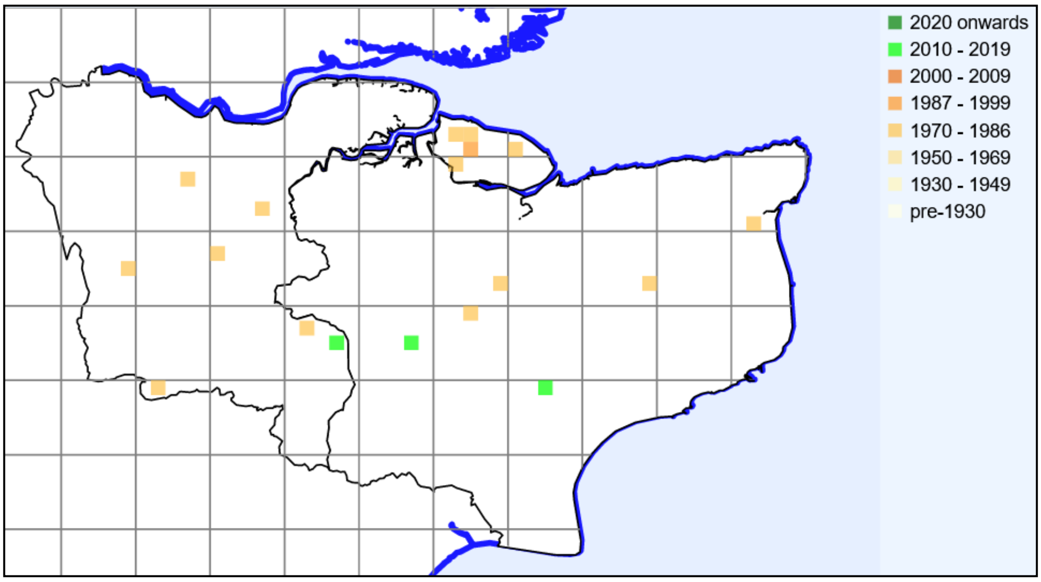
[644] Smith, A. (1994). Ranunculus arvensis L. Corn buttercup. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough.

[645] Torra, J., Recasens, J. & Royo-Esnai (2018). Seedling emergence response of rare arable plants to soil tillage by species. *PLoS ONE* **13(6)**: e0199425.

TQ45X, TQ53J, TQ56T, TQ65D, TQ66R, TQ74I, TQ94P, TQ95W, TQ96J, TQ97G, TQ97K, TQ97L, TR07A, TR15W and TR36F, and are given in the map instead.



***Ranunculus arvensis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Farningham	TQ5666		1972	RMB	TQ 5667 6627, one plant in corner of a cornfield.
Marden	TQ7644		(1) 16 May 2010 (2) 9 May 2009 (3) 2 May 2005 (4) 26 May 2003 (5) 21 May 2002 (6) 16 May 2000 (7) 1991-99 (8) 1985 (9) 12 June 1984	(1) SB (2) DM (3) DM (4) JP (5) JA (6) JS (7) EGP (8) RoF (9) JP	(1) TQ 76393 44466, two plants. (2) (3) TQ 762 444. (4) TQ 763 444, over 30 plants seen, some in flower, some in fruit, in crop along northern edge of field. (5) In field margin near lane. (6) (7) Given as TQ74S, but taken to be TQ7644. (8) TQ 763 444. (9) TQ 763 444.
East of Headcorn	TQ8744		14 June 2019	KBRG meeting	Swift's Green, middle of large field along Rosemary Lane and south-east of Malthouse Farm. Seven flowering and fruiting plants seen on heavy clay near public footpath across a grass field. The first was in the grass crop at TQ 87484 44059 with three more a few metres away and a cluster of three further plants a few metres away at TQ 8749 4405. Associated species: *Anthemis cotula*, *Euphorbia platyphyllos*, *Lysimachia arvensis*, *Ranunculus sardous* and *Stachys arvensis*.
Sheppey	TQ9571		25 June 1987	JB	Brambledown, TQ 957 716.
Mersham	TR0438		13 May 2011	HS	TR 040 386, at least five plants on public footpath through hayfield, mown shortly after.

Ranunculus flammula L. (Lesser Spearwort)

vc15 and 16

Rarity / scarcity status

Ranunculus flammula is widespread in wet places across the British Isles. Perhaps surprisingly, it is considered to be **Vulnerable** to the risk of extinction in England, where a comparison of its area of occupancy over the periods 1930-1969 and 1987-1999 produced a calculated decline of 32% in the likelihood of recording the species. The issue is therefore not that it is especially uncommon at present, but that the rate of decline, which appears to be mainly in the south east, is concerning. There is also evidence of decline in Kent, although Lesser Spearwort is still by no means rare or scarce here. It is a Kent axiophyte, and so is indicative of good habitat.

Account

Seeds of *Ranunculus flammula* have been found in iron Age peat deposits and channel fills at the moated mediaeval farm complex excavated at Parsonage Farm, between Hothfield and Westwell, in advance of railway construction[646]. However, the first Kent botanical record for Lesser Spearwort is by Thomas Johnson in his *Descriptio Itineris* (1632), in travelling from Sandwich to Canterbury. He appears at this point to have reached the sandy woodlands east of Canterbury and, given that conditions were wet enough for him to have recorded *Potamogeton crispus* (Curled Pondweed) immediately beforehand, he may have reached the Lampen Stream. He recorded the plant twice, one being a form with serrated leaves.

Orlestone Forest. Photo by David Steere, 9 July 2016

Hanbury & Marshall (1899), who treated Lesser Spearwort as common and generally distributed in ditches and marshes (other than in chalk districts where these habitats were rare or absent), were interested in the variability of the species. Kent botanists had been claiming the presence of varieties, such as var. *reptans* and var. *radicans*. G.E. Smith, for example, wrote about the former between Beachborough and Cheriton: 'This variety …pushes forth roots, through the base of the foot-stalks of its leaves, at every joint… [which] swelling and gaining weight, bear gradually the erect stems to the earth: a colony is at once formed: the progeny rise, ungratefully trampling upon their parent; and in autumn, flowers are seen upon the young plants, whose dwarf habit constitutes them a distinct variety'. Hanbury and Marshall's conclusion was that *Ranunculus flammula* was remarkably variable, but apparently due to situation, which might cause it to be as large and stout as *Ranunculus lingua* (Greater Spearwort), but on poor soils, the leaves were apt to become linear and the whole plant dwarfed; in ditches, it was usually erect, but particularly on heaths it was more or less creeping.[647]

The county survey of 1971-80 (Philp, 1982) found Lesser Spearwort to be local in damp woodland rides,

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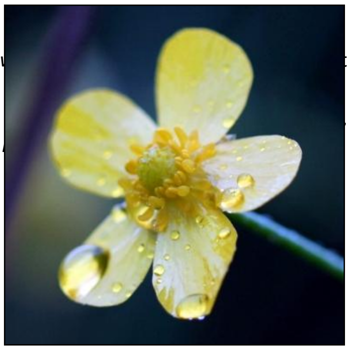
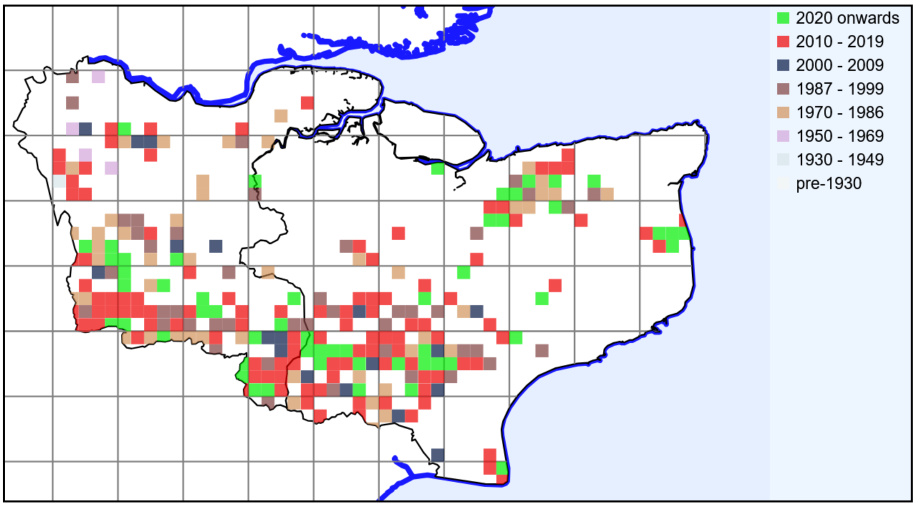
[646] A. Davies [sic] (2006). *The charred and waterlogged plant remains from Parsonage Farm, West*
Report. London & Continental Railways.

[647] Current treatment of varieties of *R. flammula* subsp. *flammula*, in Sell, P. & Murrell, G. (2018),
recognises a procumbent one rooting at the nodes (var. *tenuifolius*) and a *R. lingua*-like one, var.



marshes and ditches. There were 174 tetrad records, mainly in the Weald, but also following damp ground on the Folkestone Formation in East Kent, and the acid woodlands of the Blean around Canterbury. However, the 1991-2005 survey (Philp, 2010) showed 134 tetrads, a reduction of 23%. The distribution was fundamentally similar as regards the areas of the count involved, but more sparse within those areas. The questions then arise, whether the decline is an artefact of differences in recording as between the two surveys, and whether that decline is continuing. As regards the latter, our 2010-24 records show no further decline, in standing at 164 tetrads (222 monads). However, the 1971-80 and 2010-24 data are all the product of networked recording (and the 1991-2005 data is from solo recording), so differences in recording seem unlikely to account for the apparent decline, other than as regards the length of the survey period. The cause of decline, such as it is, is not obvious and needs to be a county-wide factor. There may yet be some under-recording in the 2010-24 records, e.g. in TQ55.

Orlestone Forest. Photo by David Steere, 9 July 2016



Ranunculus flammula **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Ranunculus flammula is a plant of wet places, where it may spread by rooting at the nodes. It also spreads by seed, and individual flowers last longer than those of comparable *Ranunculus* species, while insect visitors have been recorded as more frequent[648]; so it would seem to maximise pollination opportunities. Our recent records note it especially on acid soils, but also present on acid to neutral terrain and in fen pasture. We have noted it in wet grassland, in forestry plantations, ancient woodland, pond margins, ditches, and flushed ground, flat or sloping.

Orlestone Forest. Photo by David Steere, 9 July 2016

The plant has given its name to a Kentish expression, speer-worty, current *c.* 1735 and describing the liver of a rotten sheep, when it is full of white knots, supposed to have been caused by grazing it.[649] Lesser Spearwort has apparently been a cause of horse and cattle poisoning.[650]

Ranunculus flammula is one of the spearworts, distinct from other yellow-flowered buttercups by virtue of its lanceolate stem-leaves. The nearest Kent spearwort in appearance is *Ranunculus lingua*, which is larger than most forms of *R. flammula* and has unfurrowed pedicels (furrowed in *R. flammula*).

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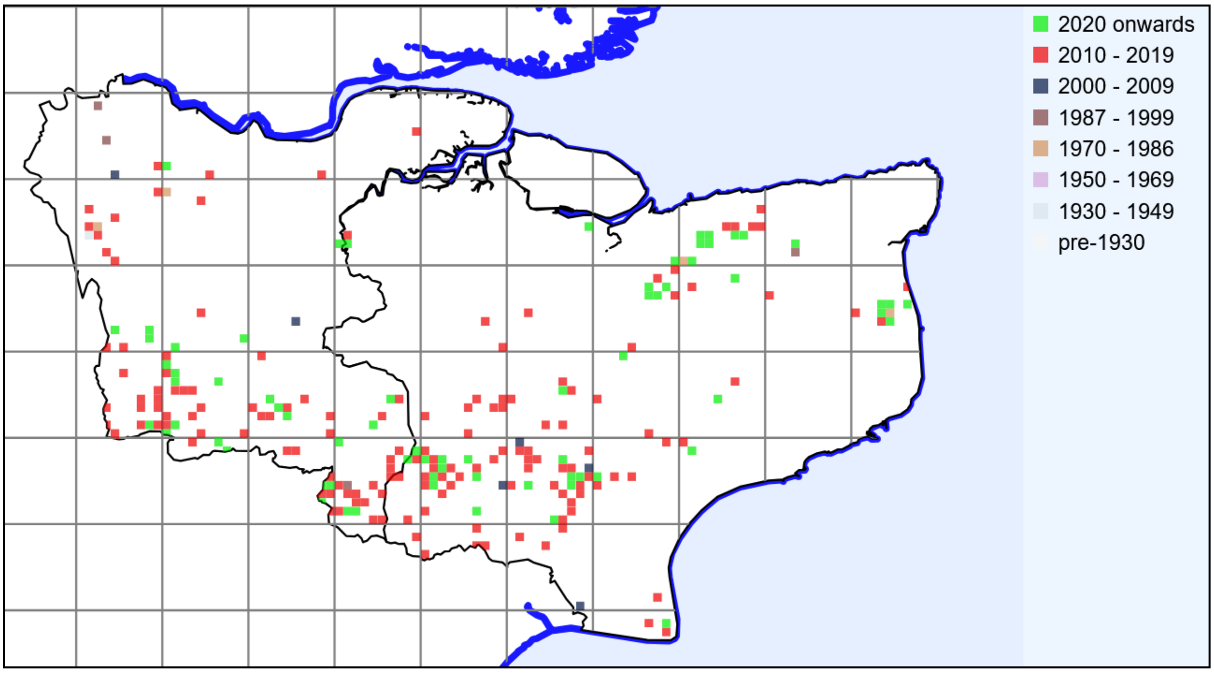
[648] Steinbach, K. & Gottsburger, G. (1993). Phenology and Pollination Biology of Five *Ranunculus* Species in Giessen, Central Germany. *Phyton* **34(2):** 203-218. A Danish study, however, noted fewer insect visitors than with *Ranunculus acris* (Meadow Buttercup), and that *R. flammula* was particularly well adapted to rain pollination (O. Hagerup (1950) Rain-pollination. *Biol. Medd. Dan. Vid. Selsk* **8(5)**).

[649] Skeat, W.W. (1874). Dr.Pegge's Alphabet of Kenticisms, and Collection of Proverbial Sayings used in Kent. *Archaeologia Cantiana* **9**: 50-147.

[650] Forsyth, A.A. (1954). *British Poisonous Plants*. Ministry of Agriculture, Fisheries and Food, HMSO.

Habitat, damp ride, Hemsted Forest. Photo by Richard Moyse, 29 July 2021

Habitat, rushy meadow valley, Pembury. Photo by Geoffrey Kitchener, 22 June 2023


🟩 2020 onwards
🟥 2010 - 2019
■ 2000 - 2009
■ 1987 - 1999
■ 1970 - 1986
■ 1950 - 1969
■ 1930 - 1949
pre-1930

***Ranunculus flammula* Kent records to 2024 mapped at monad level, from BSBI database.**

Ranunculus hederaceus L. (Ivy-leaved Crowfoot)

vc15 and 16

Rarity / scarcity status

Ranunculus hederaceus is frequent throughout the British Isles on mud and in shallow water, and its threat status is of 'Least Concern'. In Kent, it has been **scarce** for many years and its status requires further investigation – it may now be **rare**.

Account

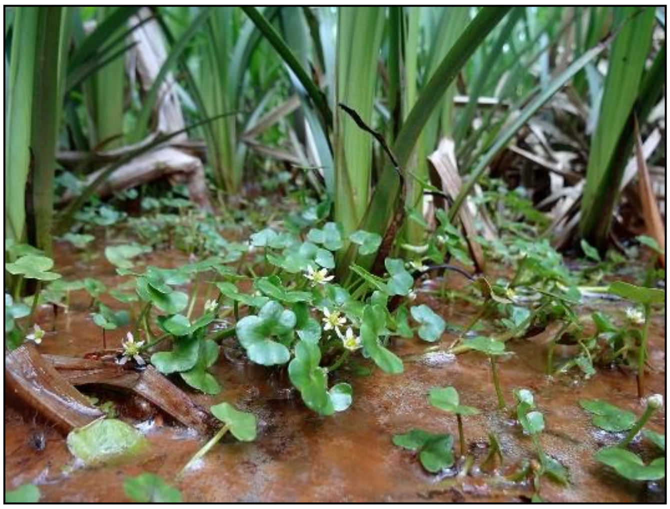
The first published Kent record is probably by Thomas Johnson in his *Descriptio Itineris* (1632). In his notes of travelling from Sandwich to Canterbury – he may have been at Wingham or Littlebourne – he remarks on several aquatic plants and 'Ranunculus hederaceus' and 'Ranunculus aquaticus rotundifolius, forte Apium risus'. Both of these, in Francis Rose's view (expressed in the 1972 edition of Johnson's book), were either *Ranunculus hederaceus* or a related species: *Ranunculus omiophyllus* (Round-leaved Crowfoot) and *Ranunculus tripartitus* (Three-lobed Crowfoot) are presumably potential candidates. There is potential for wider confusion in earlier records: it would not be surprising if Edward Jacob's record (*Plantae Favershamienses*, 1777) by the creek wall leading from Faversham to Thorn was actually *Ranunculus baudotii* (Brackish Water-crowfoot). More persuasive is Thomas Forster's assessment (in *Flora Tonbrigensis*, 1816), in relation to the acid terrain around Tunbridge Wells, that the plant grew 'In watery places, near springs, and in ditches, common'.

Willesborough. Photo by Stephen Lemon, 16 May 2015

Hanbury & Marshall (1899) treated *R. omiophyllus* as a form of *R. hederaceus*, while taking *Ranunculus lenormandii* to be a separate species, which we would now place under *R. omiophyllus*. They considered *R. hederaceus* to be a frequent native of pools, ditches and muddy ground. The records which they cited were scattered across the county. They included acid ground in north west Kent (Keston Common, said in the *Woolwich Surveys* of 1909 to have been in mud at the top of the Lower Pond in 1906, and still at Keston in 1988). In East Kent, records (if correct) appear to be associated with the Stour catchment and low ground; and there are also others which follow the line of the Folkestone Formation sands to include Brabourne Lees (boggy spots), Willesborough, Ashford, Hothfield and Bearsted – located also on the Lower Greensand Group in West Kent (e.g. Knole Park, Sevenoaks) and on Tunbridge Wells Sand (Bidborough, Southborough). There was also a record by Marshall on the high ground above Romney Marsh, near Ham Street, probably on the eastern end of the Tunbridge Wells Sand Formation which crosses the county.

The ten tetrad records of the 1971-80 county survey (Philp, 1982) fall into four areas which correspond to some of those of Hanbury and Marshall, relating to various geological sand formations. One of the areas has similarity with Marshall's Ham Street record, as the survey picked up the Crowfoot in a couple of tetrads north of Appledore. Another area follows the Folkestone Formation from Sellindge (Gibbons Brook?) westwards to Ashford. A third group lies in the Sevenoaks area (TQ55); and a fourth at Southborough (Tunbridge Wells

Sand) and Hever (either Lower Tunbridge Wells Sand or Weald Clay). Philp (1982) described plants as growing in and alongside muddy ponds and streams.



Willesborough. Photo by Stephen Lemon, 16 May 2015

Those ten tetrad records had reduced to seven in the 1991-2005 survey (Philp, 2010), when the species was said to be rather local and declining. It is unclear how far this actually represents a decline, since three of the seven records were new, in the sense of not being given in the earlier survey results. One of them, at Shottenden/Perrywood is indeed unexpected, as it has no relationship with earlier records, or their associated geology. Another, near Sandhurst also has no earlier records, but probably relates to the Tunbridge Wells Sand Formation. This suggests continued potential for *R. hederaceus* to be found in the county in open, muddy conditions on sandy ground.

It is all the more surprising that it has been found only in three sites during the period 2010-24. One sighting was in 2015, north east of Willesborough Lees, an area (at least as regards the Lees) with previous records going back to 1829. Plants were growing in a marshy flush across a low-lying sheep-grazed field where the underlying geology is Folkestone Formation sand, overlain in the wet areas by muddy peat; also on wet mud in an area dominated by *Juncus* spp.; and by a rivulet. Associated species noted were *Sparganium erectum* (Branched Bur-reed), *Typha latifolia* (Bulrush) and *Epilobium* spp. - as regards the latter, in 2016 *Epilobium obscurum* (Short-fruited Willowherb), *Epilobium ciliatum* (American Willowherb) and their hybrid *Epilobium* x *vicinum* were noted in the vicinity, that latter indicating disturbed conditions. The next sighting was in 2019 (also present in 2021), when a small amount was found growing on deep, deer-trodden mud in a pond on the Knole Park golf course, an acid habitat on Sandgate Formation geology. In 2024 it was found not to have disappeared from the Appledore area, as a record was made from a pond, the underlying geology appearing to be alluvium over Tunbridge Wells Sand.

Willesborough, habitat. Photo by Stephen Lemon, 16 May 2015

R. hederaceus usually self-pollinates before the buds open. After fertilisation, the flower stalks bend down so as to force the developing fruits into the mud below, where they may be dispersed by stock trampling and/or release into flooding waters. Germination appears more effective if ground conditions dry out before rewetting. It may behave as a winter or spring annual, depending on conditions; and also may, in consistent waterlogging, survive as a perennial, being reduced to small, tight cushions in winter. Despite our Kent experience of preference for acid conditions, *R. hederaceus* grows on calcareous substrates as well[651].

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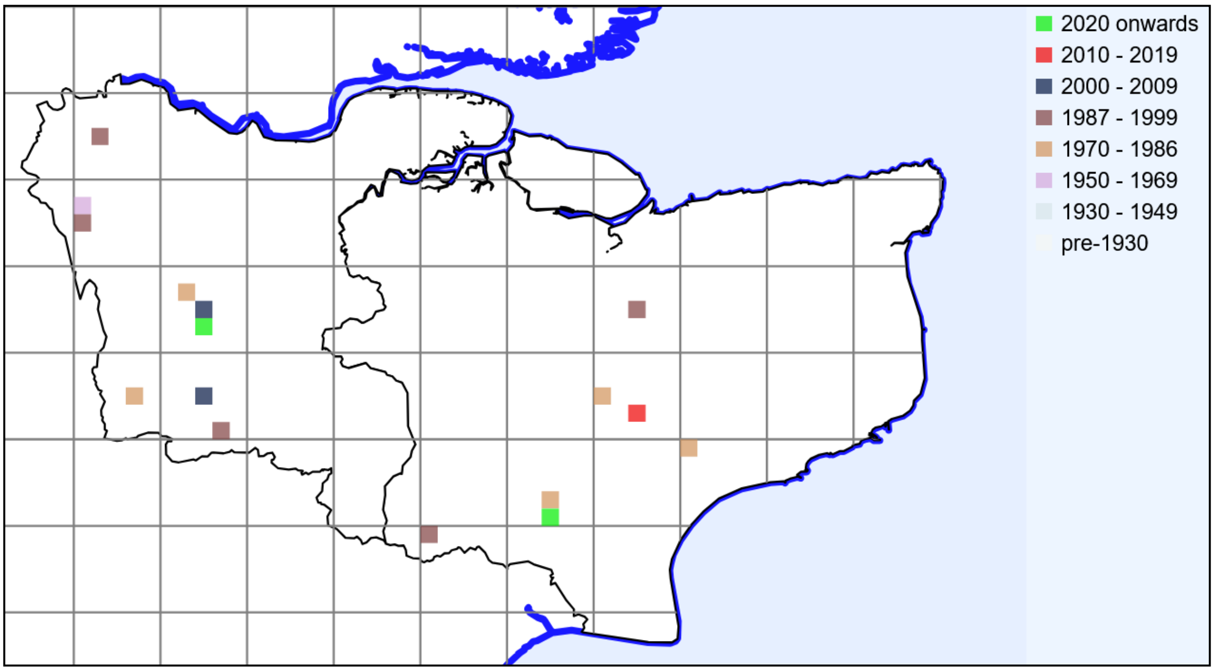
[651] Cook, C.D.K. (1966). Studies in *Ranunculus* subgenus *Batrachium* (DC.) A. Gray: III *Ranunculus hederaceus* L. and *R. omiophyllus* Ten. *Watsonia* **6(4)**: 246-259.

R. hederaceus is one of a small group of Crowfoots which comprises essentially terrestrial plants and which also includes *R. omiophyllus* (extinct in Kent) and *R. tripartitus*. It is distinguished from both of these by having its leaf lobes broadest at the sinus and petals scarcely longer than its spreading (not reflexed) sepals. It is also distinguished from *R. tripartitus* by never having divided, thread-like leaves – just lobed, laminar leaves (and the laminar leaves of *R. tripartitus* are much more deeply lobed).

From Willesborough. Photo by Lliam Rooney, 29 May 2015

Ranunculus hederaceus **Kent records to 2024 mapped at tetrad level, from BSBI database.**



Site	Grid reference	Site status	Last record date	Recorder	Comments
Hever	TQ44S		After 1970, before 1981	Philp (1982)	
Keston Common (metropolitan vc16)	TQ46C	SSSI, Access land	(1) 1988 (2) 8 July 1987 (3) 1986	(1) GMH (2) RMB (3) JP	(2) TQ 418 641, SW corner of pond. [LNHS records for this location go back to 1917; searched for by RMB in 2000 and later, but not re-found.]
Eltham (metropolitan vc16)	TQ4374		1986	LEU	Pippenhall Meadows, TQ 438 743, central wet area.
Haysden Country Park (west)	TQ54M		26 July 2001	EGP, DG	
Southborough/ Broomhill	TQ54Q		(1) 1991-99 (2) After 1970, before 1981	(1) EGP (2) Philp (1982)	
Sevenoaks (north)	TQ55I		After 1970, before 1981	Philp (1982)	
Sevenoaks (Knole Park)	TQ55L, TQ55M	SSSI	(1) 8 June 2021 (2) 18 June 2019 (3) 24 August 2001 (4) After 1970, before 1981 (5) October 1979	(1) GK (2) GK (3) EGP, PH (4) Philp (1982) (5) ACJ	(1) TQ 54461 53908, a few plants, some flowering, on wet mud in corner of pond by golf course, same site as 2019. (2) TQ 54460 53910, a few small plants on deep, deer-trodden mud in south-western corner of steep-

					sided pond on Knole Park golf course, acid on Sandgate Formation. (3) Given as TQ55L (Fawke Common) and TQ55M (Godden Green), but both could have been deer-trampled pond edges in Knole Park (and at least one of these records was). (4) TQ55L, TQ55K. (5) Knole Park, TQ 544 538, det. EGP. [May be the same as (2) above, for TQ55L.]
Lamberhurst Quarter	TQ6539		16 September 1999	NFS	TQ 650 390, small patch in seepage.
Near Sandhurst	TQ82E		1991-99	EGP	Given as TQ82E 'Hoads Farm', but latter is tetrad name, not necessarily site-indicative.
Appledore Heath	TQ93K		(1) 4 May 2024 (2) After 1970, before 1981	(1) JR (2) Philp (1982)	(1) TQ 95751 30226, petals 3mm and sepals not reflexed, pond next to PROW. (2) TQ93K [NB Francis Rose was aware of a record near the Royal Military Canal at Appledore.]
South of Woodchurch	TQ93L		After 1970, before 1981	Philp (1982)	
Ashford (north)	TR04C		After 1970, before 1981	Philp (1982)	
Willesborough / Hinxhill	TR04L		(1) 16 May 2015 (2) 11 August 2001	(1) SL (2) EGP, JBev	(1) Marshy flush across sheep grazed field: TR 04210 42915 (small flowering patch in flooded field corner with *Sparganium erectum*, *Epilobium*, *Typha latifolia*), TR 04257 42891 (wet mud in *Juncus* dominated area), TR 04286 42853 (a few small plants next to rivulet), TR 04315 42831 (thick patch near rivulet). (2) Given as TR04L Hinxhill.
Perry Wood	TR05M		1991-99	EGP	
Sellindge	TR13E		After 1970, before 1981	Philp (1982)	[Gibbons Brook? Collected from Sellindge 1956, as mentioned in *Watsonia* (1966) **6**: 246-259.]

Ranunculus parviflorus L. (Small-flowered Buttercup)

vc15 and 16

Rarity / scarcity status

Ranunculus parviflorus is more or less confined to the southern half of the British Isles, where it is most frequent in south west England. Its threat status in England and Great Britain as a whole is of 'Least Concern'. This is based in England on an assessment of records for the period 1930-1999, but a 41% decline has been detected when assessing data from 1987 onwards against all-time records, explicable if retreat to the south west had largely taken place by 1930. In Kent, it has appeared **scarce**, based on records in Philp (2010); but subsequent recording indicates that it is more common than that. It is, however, retained on the register for the time being because of the perception of its rarity in the county until now, as well as its very limited distribution outside two focal areas. It is a Kent axiophyte, and so is indicative of good habitat.

Strood/Cuxton. Photo by Lliam Rooney, 24 June 2010

Account

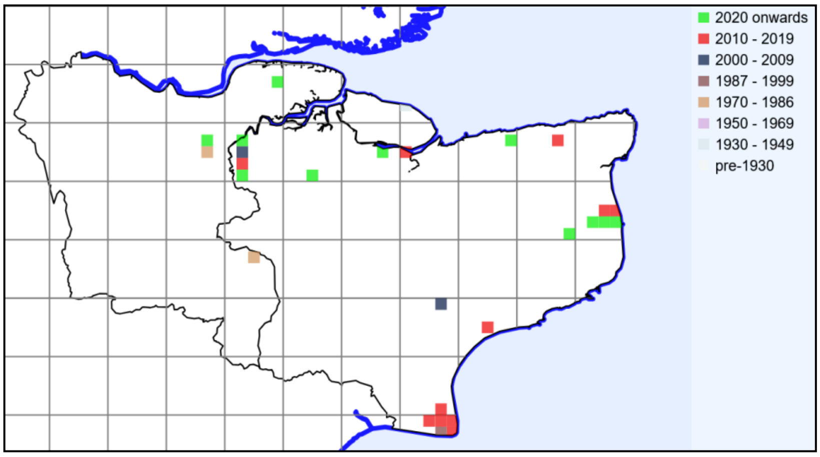
The first published record for Small-flowered Buttercup in the county is by William Hudson, in the second edition of his *Flora Anglica*, 1778. He described it as a plant of fields and meadows, on gravelly ground, and found plentifully near Greenstreet Green, next to Dartford (Habitat *in arvis et pratis solo glareoso; prope* Greenstreet Green *juxta* Dartford...*copiose*). Thomas Forster in his *Flora Tonbrigensis* (1816) noted it as 'in the lane leading from High Rocks to Rusthall Common', so no doubt this was on dry, sandy soil. G.E. Smith in his *Catalogue of rare or remarkable plants collected in south Kent* (1829) referred to it as 'by the path-way in the road from the Castle towards Mr. Gill's House, Sandgate' (John Gill was the local surgeon, and the coastal location of the castle means that the ground is likely to have been sandy, perhaps with consolidated shingle). All these early records accordingly point to the Buttercup being a plant of dry, well-drained, sandy or gravelly locations, reinforced by the description by Hanbury & Marshall (1899) as a rare plant of fields, dry banks, etc.

Betteshanger car park. Photo by Mel Lloyd, 5 May 2012

It was never common in the county, and Philp (1982) knew of it only from Luddesdown (TQ66S), Marden (TQ74N) and near Dungeness (TR01T and TR01U). Its habitat was then noted as dry fields or banks, especially where disturbed by rabbits. By the county 1991-2005 survey (Philp, 2010) its recorded presence had risen to six tetrads, but the only continuity was at Dungeness, where it was found in three tetrads on small sandy banks over shingle. Elsewhere, it was on a motorway bank near Ashford and in two localities in the Medway valley: at field edges near Wouldham and Borstal, the latter in good quantity.

Records for 2010-24, however, have shown it as present in 22 tetrads (27 monads), although largely clustered in three areas. One of these remains Dungeness, where it grows on fairly bare consolidated shingle, generally in few numbers in its individual locations. The other is at Betteshanger (formerly Fowlmead) Country Park, where it was discovered in 2012 and grows widely wherever the sharp-draining colliery spoil is exposed, at concentrations of up to 100 plants per square metre; it also extends to a nearby development site on the same substrate where found in 2020. Both these areas, Dungeness and Betteshanger, have long-term suitability because there is much terrain which remains bare or with low vegetative cover. They account for nearly half of our 2010-23 records in terms of tetrad totals: five tetrads at each of Dungeness and Betteshanger. The third area is the Medway Gap and its vicinity, where there is a scatter of sites including Burham Downs KWT reserve (either a derivative of the old inland 'dry banks' type of record, or brought in on the feet of reserve visitors); and the slopes of the Medway Valley below Cuxton Road near Strood, which in 2012 bore hundreds of thousands of plants. Although since damaged by ground clearance and stationing of excavator equipment, this last location in 2022 still carried thousands of plants, mostly spread along c. 160m of levelled ground. A nearby site at Temple Marsh, with some similar characteristics, was discovered in 2021.

Further discoveries in 2022-23 included some 20m of rabbitted arable field margin 4km west of the Medway near Cobham; a rural footath near Elvington; a cemetery at Herne; Forge Common at High Halstow; and an arable margin near Stockbury. It appears that the species has never so extensive, or at least fully recorded, in the county before. *Plant Atlas 2020* attributes a spread in southern Britain since 2000 to, perhaps, warmer spring weather.



***Ranunculus parviflorus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

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Cobham, habitat. Photo by Geoffrey Kitchener, 26 May 2022

Ranunculus parviflorus is an annual, germinating in winter and flowering as early as April. It is an opportunist, taking advantage of bare ground, often in temporary habitats, and sometimes flowering and fruiting as a very small plant.[652] Disturbance seems required, whether to maintain the open habitat or to expose the seed-bank, which appears to be persistent.

This may be by man, as with Hythe ranges where a pipeline had been excavated; or by rabbits, as noted in Philp (1982, 2010) and at Strood, where ground had been scuffed up and the competing vegetation nibbled back, except for *Glechoma hederacea* (Ground-ivy), which is thought to be avoided by rabbits. Further Strood plant associates are such as may also be seen in rabbit-frequented areas - *Cynoglossum officinale* (Hound's-tongue), *Dipsacus fullonum* (Wild Teasel), *Hypericum perforatum* (Perforate St John's-wort), *Myosotis arvensis* (Field Forget-me-not), *Jacobaea vulgaris* (Common Ragwort). Other associates observed are those growing with *Ranunculus parviflorus* at Betteshanger, and suited to open, well-drained conditions: *Cerastium diffusum* (Sea Mouse-ear), *Cerastium glomeratum* (Sticky Mouse-ear), *Erodium cicutarium* (Common Stork's-bill), *Vulpia* spp. (Fescues).

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[652] FitzGerald, R. (1994). *Ranunculus parviflorus* L. Small-flowered Buttercup. In (eds.) Stewart, A., Pearman, D.A. & P99reston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough.

It may be distinguished from other buttercups by a combination of its annual nature; its possession of (normally) five small petals and five reflexed sepals; its achenes being less than 5mm across, their faces (but not edges) covered with tubercles bearing short hooked spines; and the plant being hairy (other than the receptacle). Note that *Ranunculus sardous* (Hairy Buttercup) may also be found in field margin habitats, but these tend to be clay, and not well-drained. *Ranunculus sardous* also differs in having a hairy receptacle, larger pale yellow flowers and achenes with warts round the margin rather than being covered with spinous tubercles.

Strood, note evidence of rabbits. Photo by Geoffrey Kitchener, 14 May 2022

Site	Grid reference	Site status	Last record date	Recorder	Comments
Cudham (metropolitan vc16	TQ45P		1984	JP	Chalky field edge.
Luddesdown	TQ66S		After 1970, before 1981	Philp (1982)	
Strood / Cuxton	TQ7267		(1) 22 May 2012 (2) 15 May 2002	(1) GK (2) JP	(1) Scattered along 350m length of site between Roman Road and A228, from TQ 72576 67918 to TQ 72289 67710, most frequent at north east end, where ground at times carpeted. Hundreds of thousands of plants overall. On tipped ground, clay, most frequent in semi-open parts. Site appeared to have been rabbit-grazed, with unpalatable plants frequent - *Glechoma hederacea, Hypericum perforatum, Dipsacus fullonum,* etc. Site known from previous years, when may have been even more of *R. parviflorus.* (2) TQ 725 678, in thin grassland, large numbers of plants spread across the area in open ground, heavily rabbited.
Strood / Cuxton	TQ7367		6 June 2021	DG & SP	TQ 73095 67910 - TQ 73094 67925, scattered over area of thin soil with *Glechoma hederacea* on formerly tipped ground at Temple Marsh.
Burham Down	TQ7362	SSSI, KWT managed reserve	(1) 9 May 2011 (2) 29 April 2011 (3) 24 May 2010	(1) DG (2) DM (3) DG & SP	(1) TQ7362. (2) TQ 7340 6233. (3) TQ 73429 62336, Burham Down KWT reserve, patch of c. 55 plants

					in area of c. 1sq m. Close to fence at southern end of reserve, 50m up from gate.
Marden	TQ74N		After 1970, before 1981	Philp (1982)	
Wouldham	TQ76H		28 June 2006		Field edge.
Borstal	TQ76I		After 1990, before 2006	EGP (Philp, 2010)	Field edge, in quantity.
High Halstow	TQ7876		21 May 2023	DS	Single patch on common at TQ 78324 76093 and very abundant along woodland path in the area of TQ 780 761.
Stockbury	TQ8461		9 June 2023	GK	TQ 8459 6125, one plant at weedy ex-arable field margin, on clay-with-flints.
Conyer north	TQ9665		20 May 2023	AL, JM & JBr	TQ 9616 6500.
Oare	TR0064		1 June 2019	LR & DC	One plant by a spoil heap in former gravel pit at TR 00316 64198, plus scattered plants there from TR 00480 64351 to TR 00488 64366
Dungeness	TR0518	SSSI, National Nature Reserve	27 April 2014	TI	10 plants at TR 05997 18466.
Dungeness	TR0616		(1) 27 June 1996 (2) 1976	(1) EGP (2) EGP	(1) Given as TR01T, and may or may not belong to this monad. (2) TR0616.
Dungeness	TR0618	SSSI, National Nature Reserve	(1) 27 April 2014 (2) 27 May 2012	(1) TI (2) SB	(1) 15 plants at TR 06063 18528, 120 plants at TR 06360 18064 and 10 plants at TR 06778 18182. (2) Pathside on RSPB reserve at TR 06358 18060. [A record from Philp (1972) for TR01U may or may not belong here.]
Dungeness	TR0619	SSSI	15 June 2010	GK	One plant on bare-ish consolidated shingle, TR 06462 19895.
Lydd airport	TR0621	SSSI	June 2014	FJR	TR 06911 21331, from Lydd airport lands survey.
Dungeness	TR0718	SSSI, National Nature Reserve	27 April 2014	T!	15 plants at TR 07007 18578.
Dungeness	TR0816		14 May 2005	DM	TR0816
Dungeness	TR0817	SSSI	(1) 25 May 2012 (2) 14 May 2005 (3) 6 June 1995	(1) CO (2) JS (3) DW	(1) By old rail track south of Long pits, one extensive patch. (2) TR 081 171. (3) TR 08531 17214, new patch near Teasle Bank. [A record from Philp (1972) for TR01Y may or may not belong here.]
Dungeness	TR0818		(1) 2010 (2) 25 May 2012	(1) TI (2) CO	(1) (2) Sandy hillocks near southern long pit, few small plants. [A record by EGP on 27 June 1996 for TR01Z may or may not belong here.]
Mersham-le-Hatch	TR03U		25 May 2006	EGP	
Lydd ranges	TR1534		29 June 2013	SB & OL	MOD Ranges, plants spread along 30 metres of shingle at [TR 150 810] [gridreference evidently incorrect] where a pipe had been recently buried.
Herne north	TR1866		16 May 2023	DC	TR 180 666, two good sized patches in south west corner of Herne cemetery.
St Nicholas at	TR2666		9 May 2016	CO	c. 1 sq metre, but sparse and

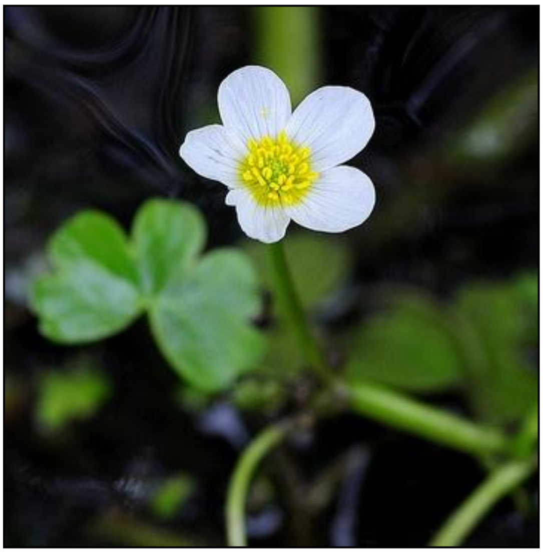
Wade					patchy adjoining old fence post just off to north of public footpath at TR 2675 6685; plus three plants / very small patch along same fence line of next paddock north.
Elvington	TR2851		23 April 2023	FK	TR 28200 51990, at Kelk Hill, between Elvington and Nonington, first seen 23 April, returned 29th, at least 10 plants, growing on the north side of the footpath in that location with woodland to the north, and a broken hedge and open fields to the south.
Betteshanger	TR3352		26 May 2020	SB	Large concentration of plants on colliery shale at TR 3366 5281, proposed development site at Betteshanger Sustainable Parks.
Betteshanger	TR3353		(1) 29 May 2024 (2) 23 September 2015	(1)DS (2) SB & LR	(1) TR 339 530. (2) A patch of plants on bare colliery spoil at TR 3383 5312.
Betteshanger	TR3453		(1) 18 May 2021 (2) 1 June 2008	(1) SC (2) JS	(1) Eight clumps by roadside on colliery spoil TR 3401 5325. (2) TR 3494 5387, country park
Betteshanger	TR3553		(1) 22 May 2023 (2) 14 May 2012	(1) SC (2) SB	(1) Betteshanger Park Swathe about 4m wide TR 3504 5382. (2) On bare ground/colliery spoil around much of the cycle track and footpath margin within the Country Park e.g. at TR 35309 53463, also under new tree plantings at TR 35185 53677 and in many other places where the colliery spoil remains exposed. Density reaching as many as 100 plants to 1 sq metre.
Betteshanger	TR3554		(1) 19 April 2014 (2) 19 May 2013 (3) 14 May 2012 (4) 5 May 2012	(1) JL (2) KBRG meeting (3) SB (4) ML & SC	(1) TR 3563 5431, pathside, grassland. (2) (3) On colliery spoil on traffic roundabout at TR 35199 54018, in nearby car park and frequent in the Country Park wherever the colliery spoil remains exposed. Density reaching as many as 100 plants to 1 sq metre. (4) TR 35245 54059 & TR 35257 54049, on gravel / shale spoil at country park carpark, including in amenity planted areas.
Betteshanger	TR3653		(1) 25 March 2023 (2) 19 May 2013 (3) 14 May 2012 (4) 23 June 2007	(1) SB (2) GJ (3) SB (4) BL	(1) Still present in good quantity by cycle track at TR 36090 53803. (2) Edge of track at rear entrance to Fowlmead TR 36159 53772. (3) Frequent within the Country Park wherever the colliery spoil remains exposed e.g .at TR 36183 53915. Density sometimes as much as 100 plants to 1 sq metre. (4) TR 3494 5387, along slope by new planted trees ; and TR 36254 53985 on established old turf near colliery edge.
Betteshanger	TR3654		(1) 19 May 2013 (2) 14 May 2012	(1) KBRG meeting (2) SB	(1) (2) Frequent within the Country Park wherever the colliery spoil remains exposed e.g. at TR 36181 54244 with *Cerastium diffusum, C. glomeratum, Erodium cicutarium, Vulpia* sp etc. Density as much as 100 plants to 1 x 1 metre.

Ranunculus peltatus Schrank (Pond Water-crowfoot)

vc15 and 16

Rarity / scarcity status

Ranunculus peltatus is an aquatic found through most of the British Isles except northern Scotland and its threat assessment for England and Great Britain as a whole is one of 'Least Concern'. In Kent, however, there is evidence of serious decline and, although current records do not demonstrate quite the extent of loss as had been supposed, the history of decline is such that the species is being maintained on this register, even though not quite qualifying as locally **scarce**. It is a Kent axiophyte, and so is indicative of good habitat.



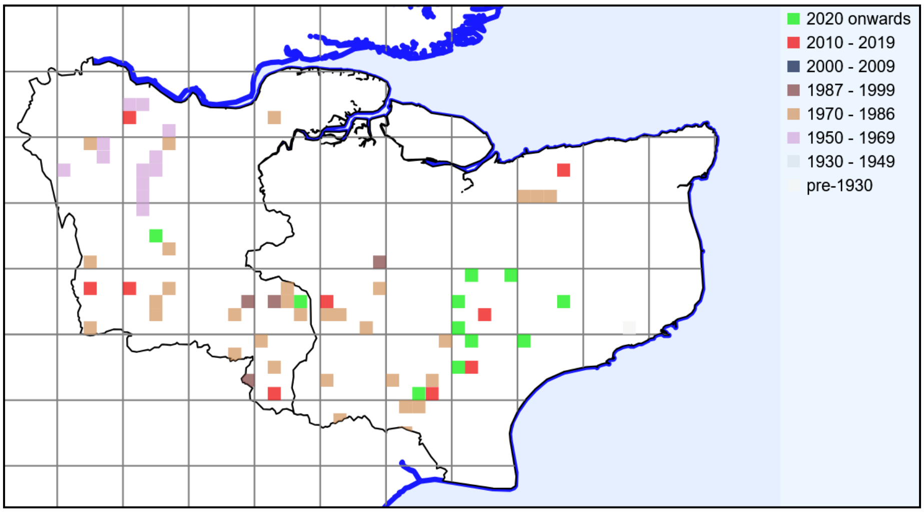
The Dowels. Photo by Lliam Rooney, 27 June 2012

Account

Early records are complicated by the names used: Hanbury & Marshall (1899) list separately under *R. peltatus* records which were then taken to be taxa called *truncatus* (this now appears to be a synonym of *R. peltatus*); *floribundus* (also a synonym of *R. peltatus*); *pencillatus* (this is now treated as a separate species, and in Kent is *R. pencillatus* subsp. *pseudofluitans)*; and they also have a separate species *R. heterophyllus*, of which at least some records we would now put under *R. peltatus*. Pre-Linnean names are no less difficult, but it appears as though Thomas Johnson's Ranunculus aquaticus hepaticae facie, Lob. Polyanthemum aquat. Dod. is almost certainly *R. peltatus*, which places the first Kent record as found by him with other marsh dike flora travelling from Sandwich to Canterbury (*Descriptio Itineris*, 1632). Hanbury and Marshall regarded *R. peltatus* as locally abundant in ponds, streams, and marshes, although if one strips out their records of '*R. pencillatus*' (these belong to rivers), we are left with just ponds and ditches as habitats.

Monks Horton, habitat. Photo by Brian Banks, 29 April 2015

Indeed, Philp (1982) shows very clearly that for 1971-80, *R. pencillatus* subsp. *pseudofluitans* was a Water-crowfoot almost confined to the Darent and Stour, whereas *R. peltatus* was frequent in Wealden ponds, also occasionally elsewhere in deep slow-flowing marsh dikes. A total of 36 tetrads was recorded, so it is surprising that for 1991-2005 Philp (2010) located only seven tetrads, all in the Weald. Apparently, the plant was specifically searched for at a number of former locations and not found; even allowing for where it may have been missed, there had been serious loss. It is not obvious to what this may be attributed. Ponds may be subject to a cycle of domination and over-shading by willows from which they may or may not be rescued by clearance; but different, widely scattered sites are scarcely likely to have the same periodicity. It does not seem to be an artefact of recording, as our 2010-24 records are for 20 tetrads (21 monads) so, although the decline is not quite as serious as indicated by Philp (2010), it is still a loss of 42% since 1971-80.



***Ranunculus peltatus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

That loss is indicated on the accompanying tetrad distribution map featuring widespread and scattered 1970-86 records across the High Weald. The 1950-69 records shown for the Darent valley should be ignored, however. These are almost certainly *R. pencillatus* subsp. *pseudofluitans* and derived from the *Flora of the London Area* (R.M. Burton, 1983) which recognised that distinguishing between the two species came too late to be reflected in its records.

Hamstreet. Photo by David Steere, 19 May 2019

The 2010-24 records have restored a little of the more extensive distribution known in 1971-80, by showing presence outside the Weald. A 2010-11 find in a small pond at Dartford Heath repeats a 1971-80 tetrad record here.

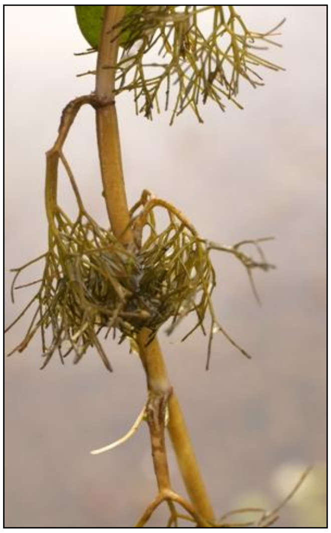
Gibbins Brook. Photo by Lliam Rooney, 30 June 2013

Records for 2013-14 at Herne Common also repeat an earlier tetrad record, but show very different levels of abundance, as well as different ponds. A 2019 record (still present, 2024) for a deer-tramped pond in Knole Park, TQ 54953 54188, was new, and a surprise (the recorders were expecting *Ranunculus hederaceus*). Although one of the 2010-24 records was for a ditch (at the Dowels, near the Royal Military Canal), all others were for ponds, and frequently those in fields grazed by sheep, cattle or horses. It may be that marginal trampling assists the species, but it must also be the case that grazing and pond maintenance for grazing access inhibits tree growth which might over-shade. A 2014 record near Staplehurst noted the Water-crowfoot in a small area of open water cordoned off for animals to drink, while the rest of the pond was shaded by trees.

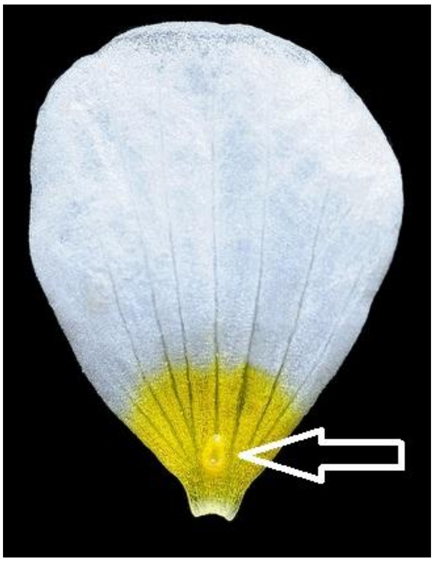
Apparently, *Ranunculus peltatus* can show considerable plasticity of form and behaviour according to season and under different environmental conditions, in nutrient-poor undisturbed sites having small flowers and achieving little sexual reproduction; in nutrient-rich undisturbed sites having long, branched shoots; and in weakly shaded disturbed sites being small but having many flowers.[653] Its development may be regarded as taking place in four stages: elongation (April to June), flowering (May to June), decline/fragmentation (June to July) and regeneration (July to August): regeneration has been found to occur only for unshaded or 50% unshaded plants, darkness preventing plants from re-growing; maximum development occurs when growing at 32cm depth.[654] Somewhat surprisingly, the growth of buds and flowers in April appears to be enhanced by low concentrations of phosphorus and restrained by higher ones.[655]

It should therefore not be unexpected that changes in a pond environment will affect the presence, or the flourishing of *Ranunculus peltatus* there, but we have not been able to correlate Kent records over time to demonstrate cause and effect, other than in relation to shading.

Ranunculus peltatus may be distinguished from other Water Crowfoots by a combination of the following characters: the presence of both shallowly lobed laminar leaves and thread-like leaves (although it can have a temporary terrestrial state with thread-like leaves only); the latter leaves shorter than the adjacent stem internode; sepals spreading and non-blue tipped; pear-shaped nectar-pit on 11-22mm petals.



Hamstreet. Photo by David Steere, 19 May 2019



From The Dowels, showing nectar-pit. Photo by Lliam Rooney, 28 June 2012

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[653] Garbey, C., Thiébaut, G. & Muller, S. (2004). Morphological plasticity of a spreading aquatic macrophyte, *Ranunculus peltatus*, in response to environmental variables. *Plant Ecology* **173**: 125-137.

[654] Dates relate to northern France semi-controlled experimental observations: [654] Garbey, C., Thiébaut, G. & Muller, S. (2006). An experimental study of the plastic responses of *Ranunculus peltatus* Schrank to four environmental parameters. *Hydrobiologia* **570**: 41-46.

[655] Mony, C. Thiébaut, G. & Muller, S. (2007). Changes in morphological and physiological traits of the freshwater plant *Ranunculus peltatus* with the phosphorus bioavailability. *Plant Ecology* **191**: 109-118.

Ranunculus tripartitus DC. (Pond Water-crowfoot) / *Ranunculus* x *novae-forestae* S. D. Webster (New Forest Crowfoot)

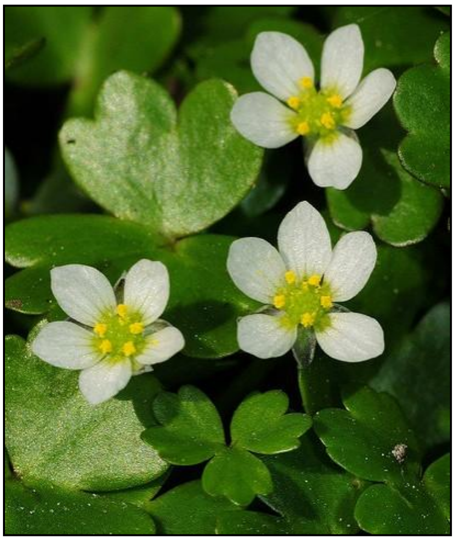
vc15; may have gone from 16

Rarity / scarcity status

This account relates to two plants, a species and a hybrid, because it has not yet been conclusively ascertained how far either or both of these are present in the county. Until 2022, it was assumed for the purposes of the rare plant register that we had *Ranunculus tripartitus* only. However, it has been said in a general assessment of British status that 'on the basis of the shape of the laminar leaves it seems likely that many, and perhaps all, of the south-eastern populations are the hybrid *Ranunculus* x *novae-forestae'* [656]. Definitive confirmation of the identity of populations requires genetic or cytological investigation and in the absence of this it is probably appropriate now to reverse the previous presumption that Kentish populations are the species and to assume that they are the hybrid until proved otherwise.

The need for review was triggered by a comment by Richard Lansdown that a photograph of what had been supposed to be *Ranunculus tripartitus* at Hothfield strongly supported an identification of the hybrid *Ranunculus* x *novae-forestae* instead. The issue arises as to whether *Ranunculus tripartitus* was present as well; but while it may be possible for an expert to be reasonably confident that material is not pure *R. tripartitus* and is probably *R.* x *novae-forestae* from photographs, it is almost impossible to conclude that there is pure *R. triparitus* from photographs. This is because while it is possible to discern characters of *R. tripartitus* together with characters which are not normal for *R. tripartitus* on a photographed plant, it may not be possible to conclude that a plant showing *R. tripartitus* characters in a photograph is not also showing out of view some characters of the hybrid's other parent, *Ranunculus omiophyllus* (Round-leaved Crowfoot). This is compounded by the potential of hybrid plants to approach the appearance of one of the parents very closely. It appears that probable hybrid identity is not limited to the Hothfield population.

In April 2022 Stephen Lemon gathered material from Longrope Wood, Orlestone Forest, at the pond from which the record for *R. tripartitus* derived. This was also anomalous - Richard Lansdown was of the view that it clearly had some characteristics of *R. tripartitus*, but that the petals are very broad and some of the floating leaves are less divided than would be expected from western material; also the capillary leaves are also more robust than is typical in *R. tripartitus*. Pending any wider resolution of the issues regarding south-east England populations, it is best treated as *R* x *novae-forestae* for now.



Hothfield. Photo by Lliam Rooney, 19 April 2011

Ranunculus tripartitus is a Water-crowfoot thinly spread across the south and west British Isles and is regarded as an **Endangered** species in both England and Great Britain as a whole. The English risk assessment is based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall English range had reduced by 79% and its area of occupancy had declined so that there was a 57% reduction in the likelihood of recording the species. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006, formerly a UK biodiversity action plan priority species, with planned actions for keeping sites open and disturbed, especially through grazing management; extending areas of managed habitat; and preventing degradation of ephemeral pools through drainage, eutrophication and competing vegetation.

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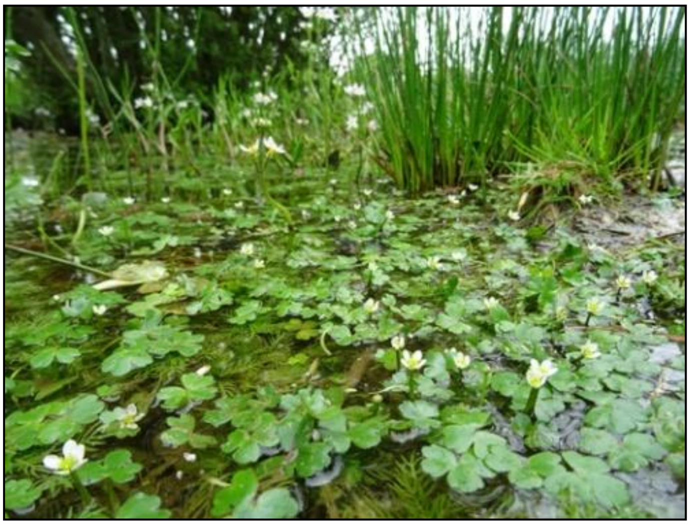
[656] FitzGerald, R. & Stewart, N.F., 2000. Three-lobed water crowfoot *Ranunculus tripartitus* Report for 1999. *Plantlife Report No. 157.*

There is no special conservation status for the hybrid, in spite of its rarity, but this is a reflection of risk assessments being normally applied to species, not hybrids. Because of the difficulty of distinguishing between the two taxa, the only practical solution seems to be to treat them as the same for conservation purposes. That difficulty also applies generally to past Kent records of *Ranunculus tripartitus*, as so this account will refer to them undifferentiated, as '*Ranunculus tripartitus'.*

In Kent '*Ranunculus tripartitus'* is on the edge of the species' British range and has always been rare, without particular recent decline; indeed, recent records have lifted it from being rare to **scarce, verging on rare**. However, the strength of the East Kent populations is such that they may well stand the best chance of avoiding the fate of extinction which '*Ranunculus tripartitus'* faces in south east England.

Account

The first published Kent record was by William Borrer in the *Phytologist* (1854, vol.5, p45), in which he stated 'Shown me, in 1852, by Mr. W.W. Reeves, near Tunbridge Wells, on the Kentish side of the boundary of the counties, where he had observed it several years'. Reeves died in 1892, before Hanbury & Marshall (1899) was published, but had communicated to the authors that his original find was in 1846, 'In a pond near the brickfield on the right-hand side of the road between Tunbridge Wells and Southborough'; Frederick Townsend collected it here in a small pond in deep water, 1851 (specimen in **SLBI**). It is possible to place this at TQ 582 406, north of what is now Skinners' School, but the area has long since been developed. While Hanbury & Marshall (1899) describe the plant as a rare native of ponds and ditches, it looks as though they did not know of any other Kent location.



Bethersden. Photo by Stephen Lemon, 23 May 2017

The next discovery seems to have been as late as 1971 (1976?)[657], when Breda Burt came across '*Ranunculus tripartitus'* in a small pond near Bethersden, where it still continues (2017). There were no further Kent records after Breda Burt's find until the 1990s, when the adoption of *Ranunculus tripartitus* as one of the species covered by Plantlife's Back from the Brink Project resulted in well-documented surveys.[658] Site information includes the following:

Combwell Wood. There does not seem to be evidence of any sighting here earlier than that by Brian Banks in 1996, following some tree clearance. The Water-crowfoot was found in an elongated hollow bearing a shallow pool some 2-5m wide and 80m long with clear but peaty water. It may be seasonal, and dried out at least in summer 1998. In 1998 the pool was largely shaded, with '*Ranunculus tripartitus'* concentrated around the water edge with a few terrestrial plants, but mostly growing in the water, in March; all plants were aquatic in April when water levels had risen; and in decay in July when the water had gone, leaving a damp peaty surface. Associated species included *Juncus effusus* (Soft-rush), *Galium palustre* (Marsh-bedstraw), *Ranunculus flammula* (Lesser Spearwort), *Agrostis stolonifera* (Creeping Bent) and *Rubus fruticosus* agg. (Bramble). While the Water-crowfoot was restricted to the less shaded end of the pool in 1998-99, it did not grow throughout the less shaded area and showed a distinct preference for areas where the leaf litter was thinner. There are no records after 2005, and (2019) the location is very overshaded.

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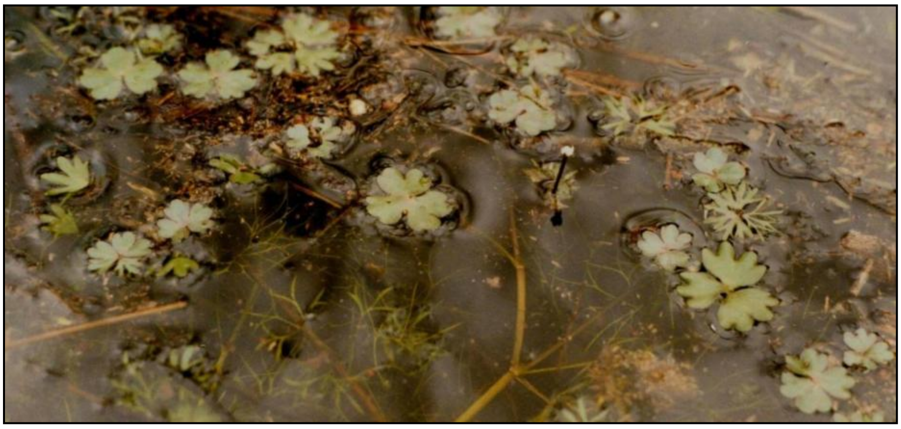
[657] Given as 1971 in the BSBI database, and there is no date in Philp (1982), but Eric Philp is understood to have said that the date was *c*.1976.

[658] FitzGerald, R., Holyoak, D., Stewart, N. (1998). *Ranunculus tripartitus* DC Three-lobed crowfoot Progress report 1998. Plantlife Report no. 113.

FitzGerald, R. & Stewart, N.F. (2000). Three-lobed water crowfoot *Ranunculus tripartitus* report for 1999. Plantlife Report no. 157 (and appendix 157a).



Combwell Wood. Photo by Rosemary FitzGerald, 9 April 1998

Bethersden. The original 1970s site could not be found, when Plantlife were investigating records, in 1998-99. It was originally recorded as a tetrad, TQ93I, in which there are, or were, 134 ponds, generally fairly shallow hammer ponds on clay. Its re-finding in 2017 in a neighbouring tetrad was as an accidental result of a KBRG meeting targeting an area which lacked recent general records. '*Ranunculus tripartitus'* was present in two small ponds, 140m apart, in sheep pasture. In the first pond encountered, the Water-crowfoot was dominant and associated species included *Hottonia palustris* (Water-violet), *Galium palustre* (Marsh-bedstraw), *Ranunculus flammula* (Lesser Spearwort), *Potamogeton polygonifolius* (Bog Pondweed) and *Veronica scutellata* (Marsh Speedwell), nearly all these being Kent rare plant register or axiophyte species, indicating a good quality flora generally. This area also yielded a further find in 2019 in another neighbouring tetrad, at the margin of a large puddle in a woodland ride.

Bethersden, habitat. Photo by Stephen Lemon, 23 May 2017

Hothfield. Surprisingly for a well botanised area, '*Ranunculus tripartitus'* was not discovered at Hothfield Common until 1994, when it was found in a vehicle rut in the lower (south western) part of Bog 1, about 30m north east of the ponds where it has since flourished. In the same year, tree clearance was carried out at the lower (south western) end of Bog 2 and then the bank which follows a sewer pipe crossing this area was enlarged to form a raised footpath. As part of this work an elongated pool was created on the upper side of the bank and in the next year, 1995, '*Ranunculus tripartitus'* was found there. In 1996 two further ponds were created to mitigate flooding at a property outside the common, below Bog 1, and '*Ranunculus tripartitus'* was found there the same year. The initial spread of the Water-crowfoot, given appropriate conditions, was therefore very rapid, overall population size being assessed at 1850 plants in 1998. But its appearance in the first place is not readily explicable. Occurrence in a vehicle rut might suggest transmission of seed on tyres, but there is no obvious place from which a vehicle might have brought it in. It is possible that it has long been present, but unseen, as very low population levels or as buried seed until conditions became favourable. Introduction with cattle grazing does not seem likely: this had ceased by the late 1950s when there were no commoners left, and grazing was not reintroduced until 1993 as regards part of the common, and 1995 as regards Bog 1 (by when the Water-crowfoot had already appeared). Introduction by birds is also possible, as with any Water-crowfoot, although there is no nearby candidate point of origin. Deliberate introduction is not impossible, given that this has been attempted here with *Sarracenia purpurea* (Pitcherplant) and, it is presumed, *Myrica gale* (Bog-myrtle). The position is complicated by a Victorian record here of *Ranunculus hederaceus* (Ivy-leaved Crowfoot), which at first sight might suggest potential for confusion of identification between different Crowfoot species or hybrids at Hothfield, but the presence of *Ranunculus hederaceus* received confirmation by Francis Rose in 1946.

Orlestone Forest. Where found by Eric Philp in 1996, '*Ranunculus tripartitus'* was growing in a small pond five or six yards across which seemed fairly permanent with an old tree lying across it, but just in an area cleared of most trees and with a fairly open aspect. The forest is managed woodland, a patchwork of conifer and deciduous blocks with occasional regenerating birch and willow. The pond was re-found in 1998 and 1999, but '*Ranunculus tripartitus'* was not seen there: it was part shaded and was becoming increasingly overgrown, in June 1999 it was without water and carried a thick layer of leaf litter. Clearance around the pond in 2003-04 brought back a few seedlings. Subsequent finds in the Orlestone Forest area have not been in the woodland, but in neighbouring fields (two ponds in TQ9735 in 2016; one in TQ9736 in 2015), until 2022 when the original pond was re-found and appeared to have been cleared out, perhaps deepened, and containing a Water-crowfoot whose identity is probably best treated as *R* x *novae-forestae* (see earlier).

Overall in Kent, there are two main types of habitat. One is in open ponds or pools; either on heathland or in pasture; either unshaded or lightly shaded; generally with some marginal trampling by livestock maintaining open conditions. The second is woodland pools (Combwell Wood, Orlestone Forest), with some access to light. It has been suggested[659] that woodland sites in the south east may be a relict rather than a preferred habitat, with shade reducing competition but also restricting '*Ranunculus tripartitus'* growth until woodland management activities afford increased light and disturbance. However, if this is to suggest that these were originally open pools swallowed up by woodland, then this would have to be a very long time ago.

Hothfield. Photo by Lliam Rooney, 19 April 2011

Ranunculus tripartitus is a wintergreen perennial, rarely an annual, characterised by its deeply three-lobed laminar leaves; it may also develop thread-like leaves. It has short blue sepals, half as long as the petals; crescent-shaped nectar pits; and a hairy receptacle. The hybrid *R.* x *novae-forestae* can differ from *Ranunculus tripartitus* by some petals exceeding 5mm long and by laminar leaves being frequently five-lobed with shallow sinuses and curved lobes. From *Ranunculus omiophyllus* it may differ by some receptacles varying from glabrous to setose and by laminar leaves having deeper sinuses and straighter edges to the lobes.[660] There can, however, be variation on a single plant; or the whole plant may be closer to, or following backcrossing, be almost indistinguishable from one of the parent species.

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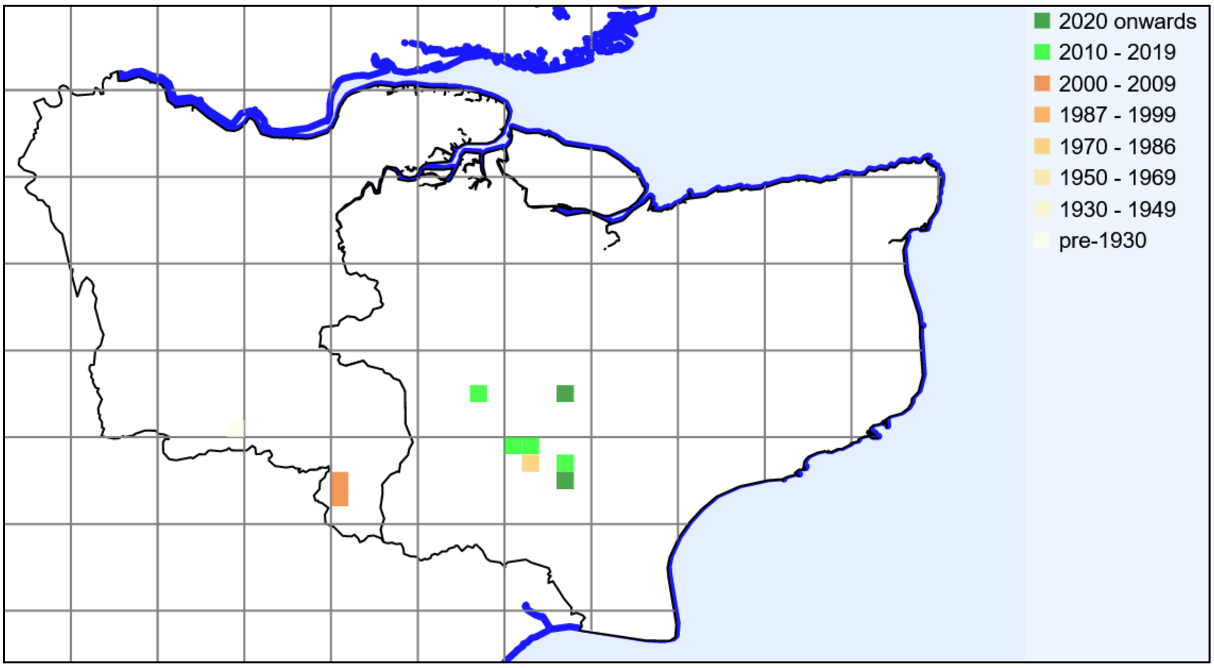
[659] FitzGerald, R., Holyoak, D., Stewart, N. (1998), cited above.

The presence of the hybrid in Kent is to a degree surprising, as there is no evidence of the historic presence of the *Ranunculus omiophyllus* parent at any current '*Ranunculus tripartitus*' site.[661] *Ranunculus omiophyllus* has very few records in the county and is currently regarded as extinct in Kent after the 1930s/40s. However, even at the time of the original naming of the hybrid (from New Forest plants), it was recognised that the plant had been found growing independently of its parents.[662]

This account has benefited from Richard Lansdown having pointed out the likely presence of the hybrid in Kent and some of the issues involved, as also from sight of a draft of his report, The conservation status of three-lobed water-crowfoot (*Ranunculus tripartitus*) in England, March 2020.

***Ranunculus 'tripartitus'* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Records determined as hybrid are given in mauve.					
[Lamberhurst Quarter]	[TQ6439]	[SNCI]	[1997]		[Tentative record by English Nature at Old Swan Farm. Not found, 1999.]
Combwell Wood	TQ7134	SSSI	(1) 19 May 2005 (2) 4 February 2004 (3) 18 July 2003 (4) 24 April 2003 (5) 16 June 1999 (6) 13 February 1999	(1) PH (2) TW, BB (3) BB (4) RS (5) NFS (6) NFS	(1) TQ 714 343. 80 plants; concerns over blanket weed coverage were discussed with Plantlife, who thought it not a problem. (2) TQ 714 343. 164 seedlings

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[660] Lansdown, R.V. (2015). Ranunculus subgenus Batrachium (DC.) A. Gray. In Stace, C.A., Preston, C.D. & Pearman, D.A., *Hybrid Flora of the British Isles*, Botanical Society of Britain & Ireland, Bristol.

[661] The South London Botanic Institute, however, holds specimens gathered in 1851 by Frederick Townend from Tunbridge Wells and filed under *R. tripartitus and R. x novae-forestae*, although the latter was not an interpretation made at the time. The original labelling of the specimen filed under *R. x novae-forestae* refers to both *R. lenormandi* (which is generally synonymous with *R. omiophyllus*) and *R. tripartitus*, and mentions the receptacle as being hispid, which points *to R. tripartitus* or a hybrid involving it. There are literature references in the 1850s to *R. coenosus* at Tunbridge Wells (including near Camden Park) which may relate to the same plant(s) or to *R. omiophyllus.*

[662] Webster, S.D. (1990). Three natural hybrids in *Ranunculus* L. subgenus *Batrachium* (DC.) A. Gray. *Watsonia* **18**: 139-146.

			(7) 1998 (8) April/ May 1996	(7) NFS (8) BB	counted towards the south tip of the pond. Some concern over Soft Rush 'explosion'. (3) TQ 71504 34282, five plants flowering (35 plants in all counted that year). (4) TQ 715 336. South end of pond, on east side [gridref considered erroneous]. (5) c. 180 plants, main concentration on eastern side of pool around the 'shore' of *Juncus* tufts and other vegetation. (6) Some 160 plants in the same place as previous year, the similarity in distribution suggesting that shade is not the only factor. (7) TQ 714 343, pond by roadside in Horsegate Wood, c. 170 plants, but suffering from shade. (8) TQ 714 343, pond by roadside in Horsegate Wood. Discovered after tree clearance around pool. [Not found, 2019.]
Kilndown	TQ74C		1991-98	EGP	Tetrad reference only. Presumed to be the same as the Combwell Wood site.
Headcorn	TQ8644		21 May 2018	SL	Sherway Road, east of Headcorn, pond at edge of pasture along road, near public footpath, TQ 86652 44401. Small patch of floating plants (not rooted) in poor condition. Laminar and capillary leaves present. Flowers very small, not contiguous and with nectar pits apparently (and anomalously) circular; sepals dark tipped / deflexing. Receptacle sparsely hairy with fruiting peduncles strongly deflexing, less than 50mm and shorter than opposing leaf petiole. Flowers the same after 5 months when plant kept in shallow water. Conf. RL, but not a typical plant.
Bethersden	TQ9138		23 May 2017	KBRG meeting	Dominant in a small peaty pond in grazing pasture at TQ 9111 3874. Associates: *Hottonia palustris, Potamogeton polygonifiolius, Veronica scutellata, Ranunculus flammula, Galium palustre*. Also present in quantity in a nearby pond at TQ 9104 3862 but with fewer associates.
Bethersden	TQ9338		23 May 2019	KBRG meeting	TQ 9321 3808, Paul's & Plurenden Woods. A small patch of flowering and fruiting plants, at the margin of a large puddle in woodland track. A few other single scattered plants alongside.
Hothfield	TQ9645	SSSI, KWT managed reserve	(1) 29 January 2023 (2) 16 April 2022 (3) 10 April 2018 (4) 20 April 2011 (5) 15 June 2010 (6) 25 May 2010 (6) 1998	(1) AL & SA (2) AL (3) SB (4) LR (5) JA (6) GK (7) NFS	(1) TQ 9671 4588. Abundant again in B3 (and B2) after a very hot, dry summer last year. (2) TQ 9671 4588. Abundant in a pool by the boardwalk across bog no. 3, determined by RL from photograph. (3) In full flower and covering a very large flooded area both at TQ 9665 4562 and at TQ 9663 4557. (4) In full flower and it seems to be

					spreading. Recorder talked to the KWT warden who confirmed. At TQ 9663 4560 area in scattered patches, but it is apparently doing quite well on west side of the bogs and even in the less acidic areas. (5) c. 15m2 bog at TQ 96641 45579. (6) In wet or drying depressions, occasional east of track for 12m at TQ 96663 45635 then in similar habitats for 19m along the west side of that track, from TQ 96657 45645 to TQ 96644 45626, then again on eastern side of track in similar habitat from TQ 96657 45611 to 96654 45598, again at TQ 96660 45685, and again in considerable quantity at muddy (part shaded) pond margins from TQ 96653 45578 to 96640 45568. [There are earlier records by various botanists, of which the following is selected:] (7) Both ponds in western end of bog 1, TQ 968 453. Pond in bog 3, TQ 967 459, one plant. Western end of bog 2, either side of old pipeline, TQ 966 456.
Orlestone Forest	TQ9735	Access land	(1) 1 May 2022 (2) 28 May 2016 (3) 15 April 2004 (4) 13 June 2002 (5) 199*6	(1) SL (1) SL (2) TN (3) TN (4) EGP	(1) Sir Edward Street's Wood, Orlestone Forest, north-west of Hamstreet, TQ 9784 3505. Recently cleared pond on the open edge of heathy grassland, along the southern edge of wood. Scattered plants flowering among *Galium palustre* and *Callitriche platycarpa* in recently cleared pond on the open edge of heathy grassland, along the southern edge of wood. Lunate nectar pits, reflexed blue sepals, laminar and capillary leaves and hairy receptacles. Alan Cooper (Hon. Warden of Burnt Oak Wood) confirmed this pond was the original site where Eric Philp recorded *R. tripartitus*. Determined as R. tripartitus by SL but fresh material sent to RL was re-determined as this hybrid, with petals very broad and some floating leaves less divided than would be expected from western *R. tripartitus.* Also capillary leaves more robust than typical in *R. tripartitu*s. RL speculated this plant might be another example of south-east England *R. tripartitus* populations which are yet to be resolved. (2) (a) Circular pond with shallow margins in middle of cattle grazed field, immediately west of Sir Edward Street's Wood, TQ 97544 35230. Pond open on all sides with one old *Salix cinerea* tree. A few flowering plants in two areas less dominated by *Glyceria* and one of these slightly poached, growing among *Callitriche*. Pond ringed by *Glyceria fluitans*, also contained

					Equisetum fluviatile, Sparganium erectum, Oenanthe aquatica, Potamogeton natans, Lemna minor, Eleocharis palustris, Alisma plantago-aquatica, Ranunculus flammula. (b) Orlestone Pastures and Woods, Shadoxhurst Local Wildlife Site (AS63), Harp Meadows, large pond along north western edge of field, TQ 97208 35928. Large patch in only shallow / muddy open corner of pond, sharing habitat with *Callitrich*e sp., *Glyceria fluitans* and *Ranunculus sceleratu*s. Discovered previously in this pond by MB and confirmed to SL. (3) TQ 978 351, three seedlings; during 2003-04 winter the land around the pond had been cleared of scrub and rushes, clearance material flailed to a mulch. No plants had been visible the previous year. (4) TQ 978 351, one mature plant in clear water. (5) TQ 979 351, a small pond in Longrope Wood [not found in 1998].
Shadoxhurst	TQ9736		9 May 2015	SL, SB & AJ	Hart Meadows, TQ 97138 36013, in flower along open edge of pond in corner of field under light woodland shade with *Ranunculus flammula, Callitriche stagnalis* and *Callitriche brutia*. Pond margin muddy and well poached.

Raphanus raphanistrum subsp. *maritimus* (Sm.) Tell. (Sea Radish)

vc15

Rarity / scarcity status

Sea Radish grows around the coasts of the British Isles but, except for Suffolk, is largely absent from east England and north Scotland. Its threat status for conservation purposes is regarded as of 'Least Concern', both in England and in Great Britain as a whole. It has always been rare in Kent, and after two sightings were made in 1991-98, it was not recorded further on a confirmed basis until 2019; so its current Kent status remains **rare**.

Account

The first Kent record was at Broadstairs by Willam Hiern, a Devon botanist, in 1869, which may well be the basis for the attribution of Sea Radish to 'Kent east?' in H.C. Watson's *Topographical Botany* (1973). There appear to be no other records until, possibly, 1932 which is the date of a specimen from Ramsgate (collector unknown) in the University of Birmingham herbarium: the identification cannot be trusted, however, as there are no mature fruits. It was claimed by W.J.L. Sladen in a 1947 record attributed to Dungeness but otherwise not noted until Eric Philp's 1991-98 records of 'convincing plants ...found a little above high-tide mark at Minster (Sheppey) TQ97R and Kingsdown TR34Y'. A record 2.8km inland at Lydd Camp (TR 0346 2018) in June 2010 is unconfirmed, although there is a 1953 record also for the Lydd ranges.

Minster. Photos by Lliam Rooney, 26 June 2019

Presence at Minster (Sheppey) has continued, with the finding on 26 June 2019 by Sue Buckingham and Lliam Rooney of a great spread of thousands of plants on shingle just above high tide mark at the base of the London Clay cliff from TQ 9606 7355 to TQ 9614 7350. These were mostly yellow-flowered but about 10% were white-flowered. Also present were some pink/lilac flowered *Raphanus* plants which may or may not be this taxon. Tim Rich, BSBI referee, commented that he had not seen pinkish flowers in *maritimus*, this being more characteristic of *Raphanus sativus* (Fodder Radish), for which basal leaves and an ovule count would be relevant to determination, and introgression was a possibility for this population.

The other recent sighting was by Owen Leyshon on 24 August 2019 on the shingle strandline at Greatstone, TR 08392 21520. This was a single plant: it would not be unreasonable to expect more occurrences, both here and around the south of Dungeness. In East Sussex, Sea Radish is considered occasional, locally frequent, and showing increase during the period 1980-90 and subsequently[663]; in 2003 it was found at Camber Sands, some 3.9km west along the coast from the vc14/15 boundary. Having regard that longshore drift along this coast is west-to-east (and hence pulls shingle along to the easterly point of Dungeness), any Sea Radish fruits which reach the sea ought to be capable of moving further in the direction of Kent. The fruits are often shed intact and ‘clearly advantageous for their tidal dispersal but possibly of almost equal value, from size and buoyancy by ensuring that they tend to remain at, or near, the shingle surfaces that they colonize’.[664] The seeds do not separate readily from their fruit casing.

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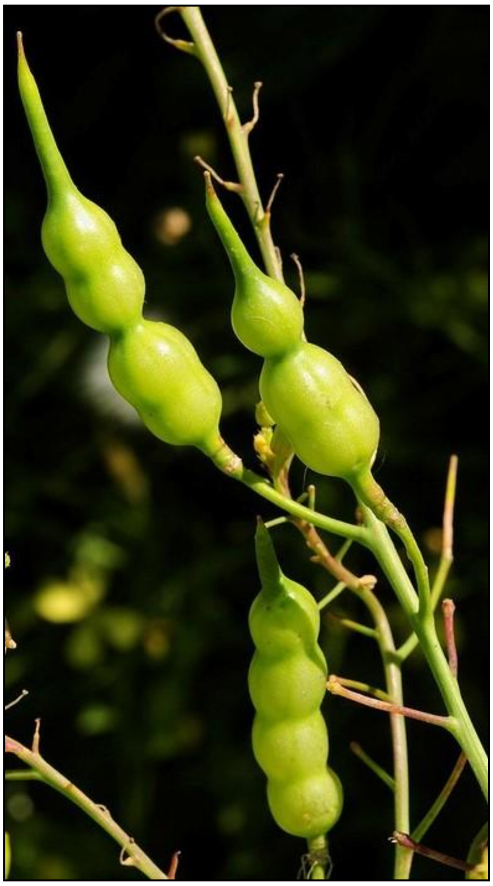
[663] Abraham, F. et al. (Sussex Botanical Recording Society)(2018) *Flora of Sussex*, Pisces Publications.

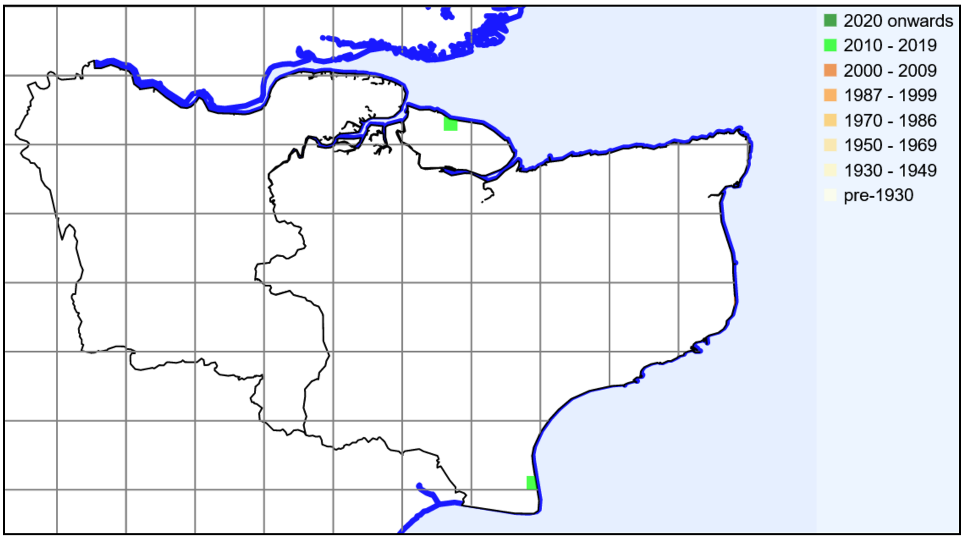
Greatstone. Photo by Owen Leyshon, 24 August 2019



Minster. Photo by Lliam Rooney, 26 June 2019

Sea Radish is a biennial or perennial of sand dunes, shingle, cliffs and open coastal grassland or disturbed coastal ground. While the normally yellow flowers (but white ones are known, as at Minster) separate it from subsp. *sativus* (Garden Radish), it is best distinguished from other Radish species by the fruits. These are strongly ribbed, with 1-5 bead-like segments (subsp. *raphanistrum*, Wild Radish, may have up to 8) which are each as long as wide (longer in subsp. *raphanistrum*), and with a beak usually no more than 3 times the length of the terminal segment((2.5)3-6 times in subsp. *raphanistrum*).

***Raphanus raphanistrum* subsp. *maritimus* Kent records to 2024 mapped at tetrad level, from BSBI database.**



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[664] Salisbury, Sir E. (1974). Seed size and mass in relation to environment. *Proc. R. Soc. Lond. B*, **18**6:83-88.

Roemeria argemone (L.) C. Morales, R. Mend & Romero Garcia *(Papaver argemone* L.) (Prickly Poppy)

vc15 and 16

Rarity / scarcity status

Prickly Poppy is an archaeophyte, or ancient introduction, of arable fields and (rarely) waste places, now more or less limited to central and south England, with a bias to the east. In conservation risk terms, it is treated as **Vulnerable** to the risk of extinction in Great Britain as a whole, and **Endangered** in England. This is on account of its area of occupancy in England being taken to have declined by 51% in comparing records for the periods 1930-69 and 1987-99; there was also a lesser decline, 39%, in its extent of occurrence. In common with many 'classic' arable weeds, it has suffered with the use of herbicides. In Kent, there has been a decline of 76% in the number of tetrad records in comparing surveys of 1971-80 and 1991-2005 (Philp, 1982 and 2010) and the species is on the verge of qualifying as scarce. It is a Kent axiophyte, and so is indicative of good habitat.

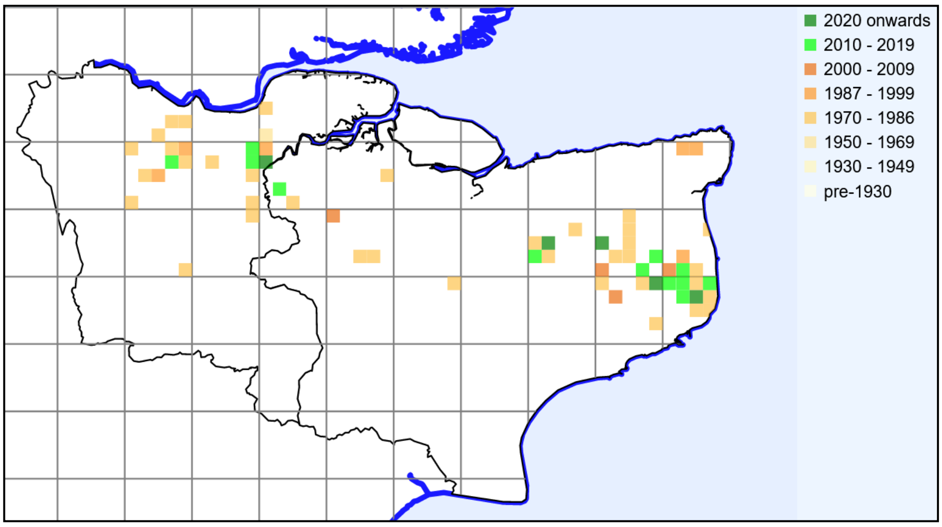
Account

The first published Kent (and second British) record is by John Gerard in his *Herball* (1597): 'These plants do growe in the corne fields in Somersetshire, and by the hedges and high waies; as yee travel from London to Bathe. '*L'Obelius* found it growing in the next fielde unto a village in Kent called Southfleete, my selfe being in his companie, of purpose to discover some strange plants, not hitherto written of'. How do we read this passage? Gerard shows in the Herball much personal knowledge of the Southfleet area, but had not recognised this poppy until a field meeting in the company of his friend and distinguished botanist, Matthias de L'Obel, who was the person who first published it (in 1576) as known in the British Isles. While the passage does not mention L'Obel as the source of information of the species' presence in Somersetshire, it otherwise appears generous in its acknowledgement. This contrasts with the reputation which Gerard acquired for claiming other people's work as his own. An alternative reading, however, might suggest that the attribution of the find to L'Obel was not in the manuscript, but could have been a correction added by L'Obel when commissioned by Gerard's publishers to put right the deficiencies of the Herball as it appeared in proof. Gerard resented this commission and had him dismissed. It is generally reckoned that L'Obel had reached the third book of the Herball before this; the poppy is dealt with in the second, so he probably had the opportunity of reviewing this passage, however it originally appeared.

West Studdal. Photo by Danny Chesterman, 9 October 2017

Amongst later writers, Thomas Forster (*Flora Tonbrigensis*, 1816) noted the species as 'In cornfields, very common'; Matthew Cowell (*A Floral Guide for East Kent*, 1839) published records about Dover, in cornfields and on roadsides at Margate, at Swalecliffe undercliff, Groveferry and in cornfields near Rochester; and Daniel Cooper (*Flora Metropolitana*, 1836) gave it at Charlton chalk pit, roadsides between Crayford and Dartford, and beyond St .John's Hole turnpike, and between Lee and Eltham. Hanbury & Marshall (1899) pronounced it to be a plant of fields, roadsides, etc., frequent throughout the county, especially in north west Kent and the chalk country districts from Rochester to Wye and Dover to Canterbury, but unrecorded at Romney Marsh.

Francis Rose treated it as a species of arable land and waste ground on chalky and sandy soils: widely but thinly distributed and rather uncommon. Many of his localities were on chalk between the Darent and Medway (11 sites) and the chalk land from the Stour to the coast (eight localities, all in the eastern part). The latter area, the hinterlands of the coast from Dover to Kingsdown, is well populated in the mapping by Philp (1982), which identified 46 tetrad records across the county, the poppy being rather local, usually in cornfields on chalky or sandy soils. By the 1991-2005 survey (Philp, 2010), however, the position appears to have changed drastically, with only 11 tetrads recorded, of which five were in the previous East Kent stronghold, and the rest scattered around the Darent and Medway valleys.



***Roemeria argemone* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The 2010-24 data so far broadly affirm the position of catastrophic decline, but show a more flourishing position in the former East Kent stronghold than was recorded in Philp (2010), although continuing to thin out in West Kent. We have found it in 17 tetrads (21 monads).

West Studdal. Photo by Danny Chesterman, 9 October 2017

Even where present, it does not seem numerous. Our 2010-24 records, where they give numbers of plants, mostly refer to a single plant. There have been sightings of 15 and 20 plants, and 40 seed heads plus a rosette; but other than these instances, or where the recorder has remarked on a scattered population, the general impression is that it is hanging on, and a cross on a distribution map may not account for much on the ground.

The use of herbicides, and possibly crop competition (as *Roemeria argemone* appears to be only weakly competitive) generally confines this poppy to field margins. At least three of our recent records relate to margins which are known to be on farms operating environmental stewardship schemes, and so likely to be protected from herbicide spraying. It is unsurprising that the species is present at Plantlife's Ranscombe Farm, where arable weeds are encouraged; and its appearance there on some experimental chalk scrapes suggests the presence of a seed-bank. Seed germination is supposed to be sporadic, dependent upon erosion of the seed-coat: seed can germinate in autumn (mostly in warm climate conditions[665]), but germination is normally slow in any event and normally takes place in spring (March to

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[665] Karlsson, L.M. & Milberg, P. (2007). A comparative study of germination ecology of four *Papaver* taxa. *Annals of Botany* **99**: 935-946.

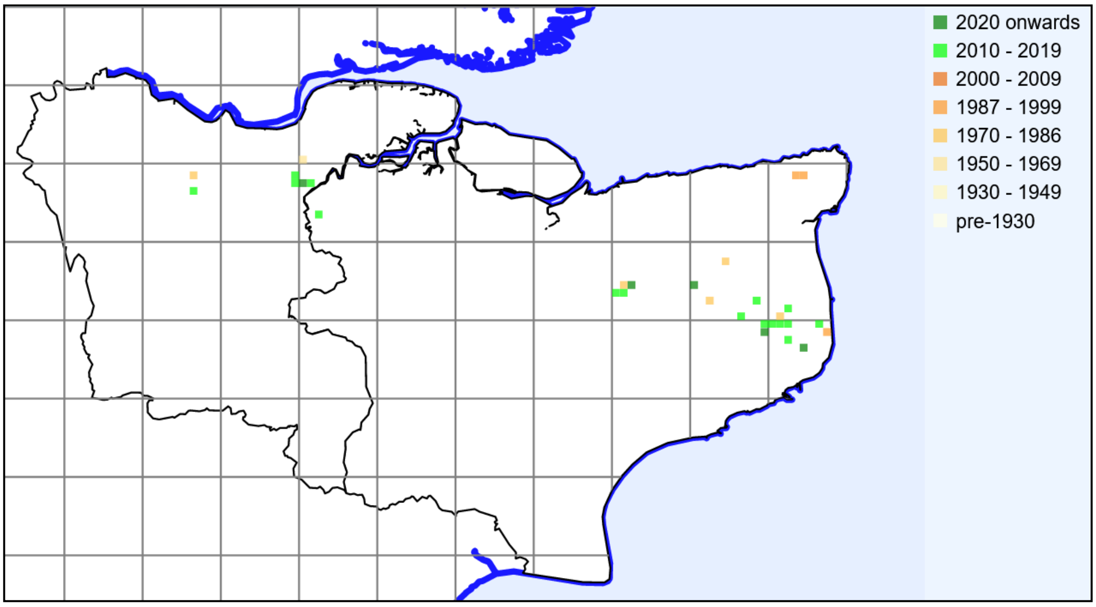
April), leading to flowering from May onwards[666]. However, all Kent records appear to be later, mostly July and August, occasionally from mid-June.

Accompanying species noted in our records are those of chalk arable margins: *Valerianella dentata* (Narrow-fruited Cornsalad), *Legousia hybrida* (Venus's-looking-glass), *Viola arvensis* (Field Pansy), *Aphanes arvensis* (Parsley-piert) and *Fumaria officinalis* (Common Fumitory).

Burham Down, habitat – also for *Clinopodium acinos* (Basil Thyme). Photo by David Steere, 3 August 2014

Roemeria argemone is separated from other British poppies, except for *Roemeria hispida* (*Papaver hybridum*, Rough Poppy), by its capsule bearing long stiff bristles, sometimes reduced in number (and very rarely without). From *R. hispida*, it is distinguished by its longer capsule, greater than 1.5cm long and often twice as long as wide, or more.

Roemeria argemone **Kent records to 2024 mapped at monad level, from BSBI database.**



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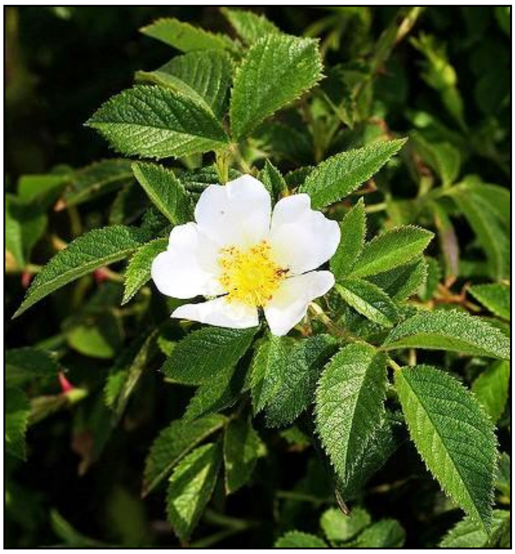
[666] McNaughton, I.H. & Harper, J.L.(1964). Biological Flora of the British Isles: Papaver, L., *Journal of Ecology* **52**: 767-793.

Rosa agrestis Savi (Small-leaved Sweet-briar)

vc15 and 16

Rarity / scarcity status

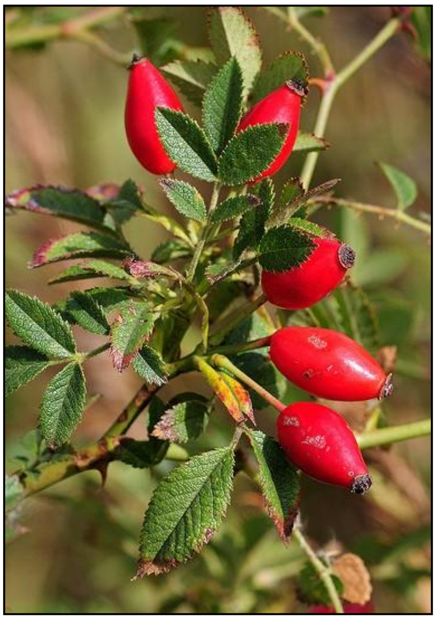
Rosa agrestis is very scattered in the British Isles and is **nationally scarce**. Due to the limited number of individual plants and its small populations, it is considered to be **Near Threatened** in England and in Great Britain as a whole; well-intentioned restorative scrub clearance may be a threat at some localities where the rose species present have not been carefully investigated. In Kent, it has been treated as rare, but on the basis of recent records is **very scarce**.



South Bank of Swale. Photo by Lliam Rooney, 1 June 2011

Account

Changing usage of *Rosa* names means that many early records in the genus are difficult to assign, but E.S. Marshall's publication in *Journal of Botany* (1891) **29**:120 of what were then notes for Hanbury & Marshall (1899) appears to be the first published account of *Rosa agrestis* in Kent: '*Rosa agrestis* Savi ("*sepium*"). Borders of chalk woods, between Chilham and Crundell. (Two stations, *Webb*, 1875; specimens in Herb. Brit. Mus.!). My plants have the leaves hairy on both sides, and white flowers.' In Hanbury & Marshall (1899), it was thought better to call the species *Rosa sepium* Thuillier, and as well as attributing the Chilham site to Marshall himself, the *Flora* elaborated on F.M. Webb's sites. One was at Sutton Valence; the other (1875) was 'On the edge of a wooded chalk bank about 1¾ mile from Adisham Station, towards Womenswould'. Material from both the Chilham and Adisham collections is in **BM** and has been confirmed by A.L. Primavesi[667]. The first West Kent record is by the Rev. John Roffey in 1911 at Cobham Great Wood (confirmed material is also at **BM**).



South Bank of Swale. Photo by Lliam Rooney, 25 September 2011

After these finds there was a long gap without any confirmed localised records until its discovery on the south bank of Swale Nature Reserve (Philp, 2010). This, when re-found in 2011 (still present, 2020), was a single bush in the open next to a dike landward of the estuarial wall. An analogous record was made in 2011 by Lliam Rooney at Horrid Hill, Gillingham, a promontory projecting into the Medway estuary, where there were a couple of bushes (three in 2015) in an isolated area on coastal rocks. A single plant in Berengrave nature reserve followed in 2012; it is 100m from the Medway estuary, and about 1.8km from the Horrid Hill site, so there are similarities.

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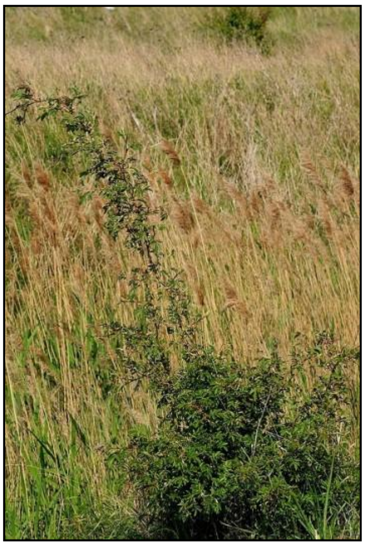
[667] Also in **BM** is a specimen gathered by T.B. Blow in September 1875 (the same month as Webb collected his specimen from near Adisham) marked as from Bekesbourne. Blow was a botanist from Welwyn, who collected *R. stylosa* from near Adisham the same month (B.E.C. Report for 1875); so it is entirely possible that he was on an outing with Webb, the attribution to Bekesbourne was approximate and his site was the same as Webb's.

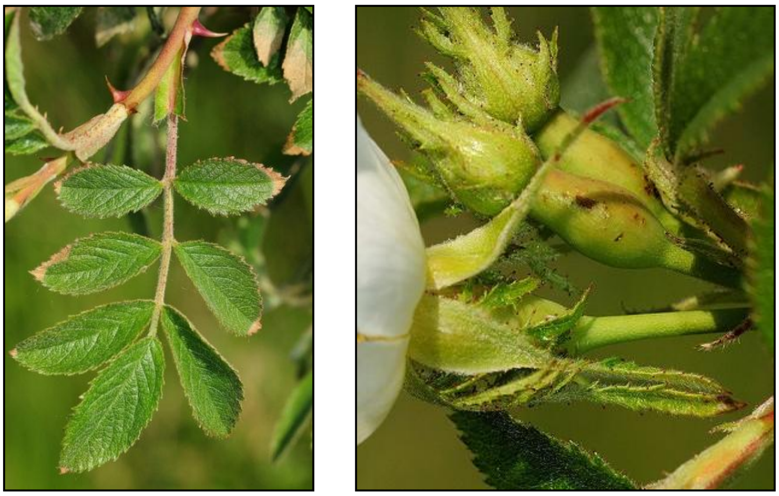
Also in 2012, a bush in a hedgerow at Boughton-under-Blean was discovered; this does not seem to follow any pattern with the other sites. That is also the case as regards a find near the M25 south east of Crockenhill in 2015, and the discovery of *Rosa agrestis* in Ditton Quarry by the *Rosa* expert, Roger Maskew. The Ditton site, a former ragstone quarry, now a nature reserve, presents some difficulties for interpretation of the status of records made here. Subsequent investigation by Sue Buckingham indicates that an area which now includes *Rosa agrestis* was planted out by the owners in the early 2000s. Although *Rosa agrestis* looks 'natural' enough here and might be thought to be a surprising species to have been planted, we cannot assume with confidence that its presence here is 'wild', unless examples are found young enough to represent naturalisation, rather than planting. The rest of the quarry site was planted out in the early 1990s when quarrying had finished, and this included roses. There are roses of all sizes, clearly spreading, and it seems reasonable to regard hybrids as having formed there on their own account. One of these (a bush at TQ 715 574) is *Rosa agrestis* (f) x *canina* (m) (*R. x belnensis*), found by Roger Maskew.



South Bank of Swale. Photo by Lliam Rooney, 6 May 2011

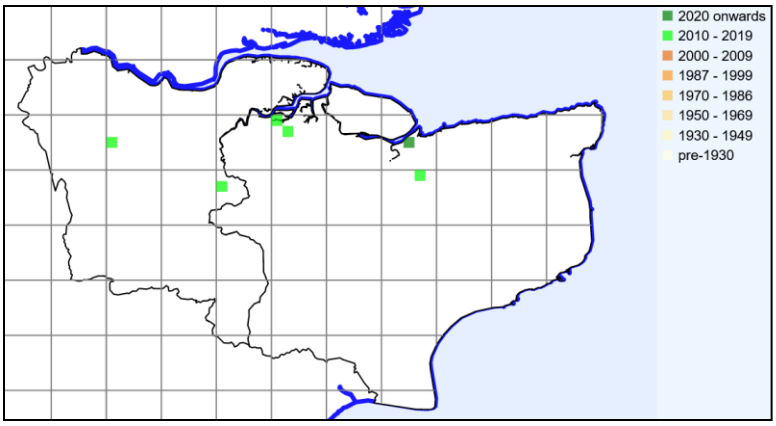
Discounting the Ditton quarry introduction, the pattern of occurrence seems fairly random except for the estuarial plants. That randomness may be a product of bird dispersal, with estuarial sites representing landfall by birds travelling along the Thames and Medway; but this is speculation.

Rosa agrestis is a Sweet-briar, noticeable from the numerous glands on the leaf undersides with their fruity odour. From the other Sweet-briars it is differentiated by a high proportion of leaves having a cuneate base. Also, from *Rosa micrantha* (Small-flowered Sweet-briar) and *Rosa rubiginosa* (Sweet-briar) it may be separated by its smooth pedicels and from the latter by having reflexed sepals.



South Bank of Swale. Photos by Lliam Rooney:
left, showing cuneate based leaves, 6 May 2011;
right, showing reflexed sepals and smooth pedicel, 1 June 2011.

Rosa agrestis Kent records to 2024 mapped at tetrad level, from BSBI database



Site	Grid reference	Site status	Last record date	Recorder	Comments
South east of Crockenhill	TQ5165		28 July 2015	RMB	TQ 5105 6557 in belt of trees at edge of field parallel to M25 motorway and separated from it by a ditch and another belt three bushes, the SW one now 5 m tall, having scrambled up a small tree now dead, the middle one nearby as large but has fallen into it.
Ditton Quarry	TQ7157	Parish Council managed local nature reserve	14 August 2015	RMa	TQ715 575, TQ715 574, single bushes in former quarry.
Horrid Hill, Rainham	TQ8168	Medway Council managed country park	(1) 13 August 2015 (2) 27 July 2011 (3) 19 July 2011	(1) RMa, GK (2) LR, GK (3) LR	(1) TQ 81083 68883, TQ 81090 68890, TQ 81093 68889, just above shoreline on west side of Horrid Hill coastal promontory. Three bushes. Reconfirmation of 2011 record. (2) Material collected from a bush at TQ 81086 68884, Horrid Hill (small bush in coastal rocks, altitude 4 metres according to GPS, but probably closer to sea level); and from a nearby bush in rough vegetation by coastal path at TQ 81096 68890. Both conf. by RMa. (3) Two bushes: leaflets were covered in stalked glands that gave off a sweet sugary smell. Sepals were hairy, reflexed with lateral lobes, and covered in stalked glands; leaflets were small and very cuneate (not hairy, however) and the pedicels were hairless and glandless. Orifice of the hips about a quarter the width of the disc.
Berengrave, Rainham	TQ8267	Medway Council managed country park	13 August 2012	SB	Single plant at TQ 82295 67540 in Berengrave Nature Reserve.
Boughton-under-Blean	TR0659		(1) 12 August 2015 (2) 5 June 2012	(1) LR, RMa, GK (2) LR	(1) TR 06583 59624, south-facing roadside hedge, Staplestreet Road. Confirmation of 2012 record. (2) TR 06583 59624. One tall plant in the hedge on the north side of Staplestreet Road, Hernhill.
South Bank of Swale	TR0464	KWT managed reserve, SSSI	(1) 15 September 2021 (2) 23 October 2020 (3) 6 May 2011 (4) 1991-99	(1) KBRG meeting (2) LR, FJR, CW (3) LR (4) EGP	(1) As previously recorded. (2) TR 04612 64909, seen in original location by a dyke near the seawall but now separated by a fence. (3) TR 04612 64909. Cleve Marshes. Behind the Sea wall next to a dyke. (4) recorded as TR06M.

Rosa spinosissima L. (Burnet Rose)

vc15 and 16

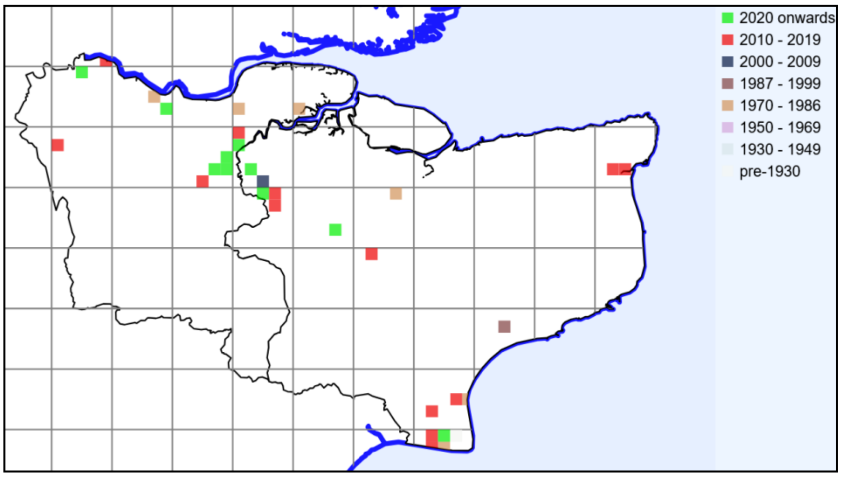
Rarity / scarcity status

Rosa spinosissima is widespread in the British Isles especially in dry, sandy places near the sea, but also occasionally inland on sandy heaths or scrubby habitat on chalk or limestone. Its threat status is regarded as one of ‘Least Concern’ in England and in Great Britain as a whole. In Kent, it has been considered **scarce** and declining, although planting has the potential to obscure its status and scarcity currently applies where clearly native. It is a Kent axiophyte, and so, where unplanted, is indicative of good habitat.

Account

The first Kent record is by Thomas Martyn in his *Plantae Cantabrigienses* (1763), ‘Between *Milton* and *Chalk*’. Hanbury & Marshall (1899) regarded the Burnet Rose as local, in bushy places, chiefly on chalk. Locations mentioned by them include a cluster around the Medway Gap and the North Downs on either side, all no doubt on chalk, although a sighting by Hanbury between Yalding and Cox’s Heath would have been different: perhaps on the Hythe Formation. Too late for Hanbury and Marshall (1899) was Lady Davy’s find of the rose at Denge Beach, Dungeness in June 1899. There is also a Dungeness specimen gathered by the Rev. Arthur Gregor in 1908 at **SLBI**.

There is continuity as regards many of these sites. There remains a scattering at Dungeness, although not necessarily at the old locations, but the sandy shingle affords one of the plant’s habitats, being well-drained. Chalk is also a free-draining medium and provides the substrate for the principal Kent native sites. Hanbury & Marshall (1899) mention a record published in 1837 of the rose ‘Between Cobham and Cuxton through Bush’ which may well correspond to Mill Hill, where Henry Ridley collected it in 1881 and where a small colony still exists, managed with Ranscombe Farm. They also refer to having seen it at Upper Halling, and it is still present in the Crookhorn Wood area, especially where scrub clearance has restored some of the past degree of openness. E.S. Marshall found it in plenty on the downs above Ryarsh, which sounds as though it was between existing populations at Crookhorn Wood and at Trosley Country Park. Both Marshall and A. H. Wolley Dod found it abundant at Boxley Warren where Francis Rose noted it in 1954 (TQ7759) and Eric Philp recorded it in the period 1991-2000 (we lack more recent confirmation). The survival of the inland populations runs counter to the trend of southern Britain, where many of these were lost by 1930.



***Rosa spinosissima* Kent records to 2024 (including planted) mapped at tetrad level, from BSBI database.**

In contrast, the report of *Rosa spinosissima* being plentiful on the hills about Dover does not seem to have continued into modern unplanted records; nor does its presence near Sittingbourne and at Darland, Gillingham.

By the time of the 1971-80 survey (Philp, 1982), *Rosa spinosissima* was considered very local and scarce in the county, on chalk downland, in sandy scrub and on beach shingle, with 13 tetrad records. These included the

Medway Gap cluster, Dungeness and also two tetrads at Littlestone. The 1991-2005 survey (Philp, 2010) gives it as decreasing, with only eight tetrads. Some of this reduction relates to odd records away from the core locations, but although Littlestone no longer featured, it has since been recorded there (2013). Our 2010-24 records, however, amount to 23 tetrads (26 monads), and so do not appear to support a case for decline. Nevertheless, at least half a dozen of these records are likely to have been planted; they include a clearly planted rose at Bromley Common, and one that is likely to have been planted, at Pegwell Bay; also a plant near Charing Heath probably associated with motorway construction.

In metropolitan West Kent *Rosa spinosissima* may be seen as garden or amenity plantings, although a small plant has been recorded, apparently unplanted, at Cross Ness sewage works, which may make a case for bird dispersal. Sometimes it is difficult to allocate a status to a plant, given the potential for birds to spread seed from garden plants (for which it is recommended as ground cover and/or for poor soil), or from plantings alongside new or reconstructed roads, where it has presumably been chosen as a native species. Several records in the Sandling / Pendenden Heath area are likely to have one or other of these origins; obvious highway planting has also been seen near Bluewater, e.g. the A296, where it is spreading (2020) by suckering.

Rosa spinosissima is known to hybridise with other roses, namely:

- with *Rosa canina* (Dog-rose) at Red Wood, Luddesdown in 1951;
- with *Rosa sherardii* (Sherard's Downy-rose) in 1893 at Upper Halling, expertly determined, but there are no recent records of *R. sherardii* in the county, let alone the cross;
- with *Rosa mollis* (Soft Downy-rose) at Halling and Trottiscliffe in 1893, expertly determined, but the continued presence of *Rosa mollis* in the county is unclear – some coastal records have been assigned to *Rosa villosa* (Villous Downy-rose), other records to a wider treatment of the species (*R. mollis* agg.);
- with *Rosa rubiginosa* (Sweet-briar) at various places 1893-1900 including Boxley Warren and Upper Halling, expertly determined; and
- with *Rosa tomentosa* (Harsh Downy-rose), seen by E.S. Marshall in 1893 at Upper Halling and re-found in the same general area in 2015 on chalk slopes from which thick scrub had been cut back (it is not impossible that the suckering growth, derived from *Rosa spinosissima*, had enabled the hybrid to persist from Marshall's time).

The suckering habit of *Rosa spinosissima* enables extensive colonies to be formed, particularly in sand dune habitats, although we have little of these in Kent and the most spreading populations are probably those at Crookhorn Wood. It appears to be light-demanding, less shade-tolerant with its compound leaves than woody species with simple leaves; and it prefers dry, warm sites.[668] The Trottiscliffe plants accord with this, being on the south-facing chalk down slopes, formerly less scrubby than now; the Boxley Warren site (subject to re-finding) is likely to be very similar; the Crookhorn Wood plants grow with southern and eastern aspects on a downland spur; and the Mill Hill site is at the top of a chalk hill with valleys on each side – old Ordnance Survey maps show this as open ground, which suffered encroachment from adjoining woodland by the 1990s, since opened up again. If shaded, it appears that *Rosa spinosissima* reduces flower production and hip formation, or has none at all.

Rosa spinosissima is distinctive by virtue of its stems having dense prickles and its leaflets being small and numerous: (7-)9-11. The flowers are solitary and the hips turn purplish-black on ripening. Hips may be larger on plants of cultivated origin (1.5 x 1.5cm for natural material in comparison with 2.3 x 1.9cm for nursery material has been reported from Germany).

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[668] Mayland-Quellhorst, E., Föller, J. & Wissemann, V. (2012). Biological Flora of the British Isles: *Rosa spinosissima* L. *Journal of Ecology* **100**: 561-576.

Rubia peregrina L. (Wild Madder)

vc15

Rarity / scarcity status

Rubia peregrina is a scrambling plant, generally found in coastal places in south and west Britain and southern Ireland. Its conservation risk status is one of 'Least Concern'. It becomes much less frequent east of the Isle of Wight, so that Kent coastal populations are somewhat disjunct, and indeed represent the most north-easterly sites up the Channel, being the limits of its European distribution in this direction (the French cliffs on the other side face north and so do not provide the warmer conditions of the Kent chalk cliffs). It is sufficiently local in the county to be treated as **scarce.**

Langdon, Dover. Photo by Lliam Rooney, 12 July 2010

Account

The first published record for Kent is stated by Hanbury & Marshall (1899) to be in Turner and Dillwyn's *The Botanist's Guide through England and Wales* (1805). This gives the plant as at 'Cliffs at Dover, East of the Caves. *Dillwyn*. About Langdon Bay, and Lydden Spout near Dover. *Mr J. Woods, jun*.' However, Lewis Dillwyn had already published part of these records as 'On the cliffs east of the Caves, and in Langdon-bay' in a paper read to the Linnean Society in 1801 (*Catalogue of the more rare Plants found in the Environs of Dover, with occasional Remarks*) and appearing in their Transactions (vol. 6) in 1802. Later nineteenth century records also extended south-westwards from Dover towards Folkestone, between Shakespeare Cliff and Abbotts Cliff. The furthest inland appears to have been Caesar's Camp, where the steep chalk slopes provide conditions in some respects comparable with those of the coastal cliffs.

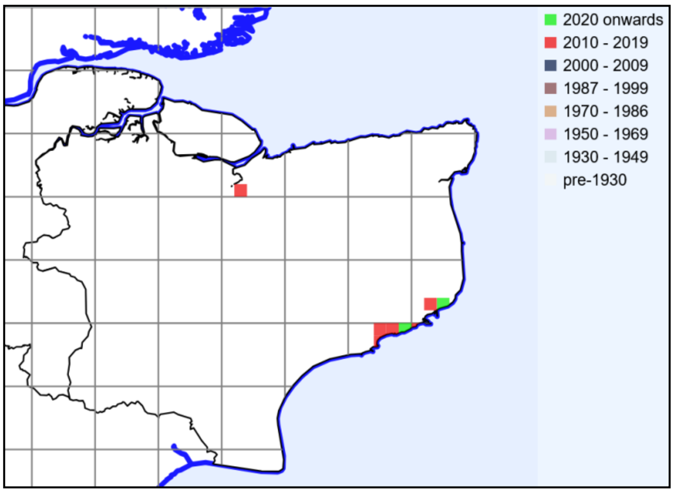
Folkestone Warren. Photo by David Steere, 9 June 2018

Except for a pre-1899 sighting between Dymchurch and Hythe, as well as a 1903 record by the Royal Military Canal, Madder has not been known as a native Kent plant other than along this stretch of coastline. Francis Rose knew it east of Dover Castle (1950-55); below Abbotts Cliff (1947-62) and on upper slopes (1973); east of Lydden Spout (1945); and at the end of Folkestone Warren (1947-62). This distribution would also be represented by three tetrads given in Philp (1982), where the species is described as very local and rare; but a further tetrad, TQ35Q at Deal, is also given, which seems surprising, as this is a fairly built-up area well separated from the core populations.

It is also puzzling that Philp (2010) describes the plant as on the chalk cliffs from Folkestone to Deal, but gives four tetrads, none of which is near Deal. Our 2010-24 records are for eight tetrads (11 monads), all within the traditional Dover-Folkestone area, except for a couple of sightings in or by roadside hedges near Faversham which are surprising but may have a relationship with a former nursery[669]. It seems fair to conclude that the Kent populations are more or less constant, the increased number of recent records perhaps representing more thorough survey of the relevant area.

Madder grows as a perennial scrambling plant on the south-facing coastal chalk slopes. While it has been seen on bare chalk and on the concrete sea wall, it can thrive in less open habitats through its ability to climb over scrub, including *Ligustrum vulgare* (Wild Privet), *Crataegus monogyna* (Hawthorn) and *Cotoneaster* sp. The exposure to sun and the free-draining chalk substrate, with little overlying soil, is a particularly demanding habitat for which Madder has stress resistance[670]. It has low transpiration with good photosynthesis in the aerial part and the capacity to conserve water and to have large starch reserves in the subterranean portion. The underground stems or stolons are partially red and partially yellow, the latter parts having starch reserves and a higher water content.

Habitat, Folkestone Warren. Photo by David Steere, 9 June 2018



***Rubia peregrina* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Rubia peregrina is distinctive and differs from cultivated *R. tinctoria* in having dark (not light) green leaves with obscure (not prominent) lateral veins beneath.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Faversham	TR0260		(1) 9 May 2014 (2) 10 October 2013	(1) & (2) LR	(1) TR 02376 60307, a well established plant in growing over a hedge in Selling Road. [This area has since been redeveloped but at the time this was a planted hedge bounding a former nursery, and the plant may have had a nursery-related origin.] (2) TR 02516 60346, a young plant present amongst *Galium aparine* on a bank at Love Lane; seemingly sown from an established parent plant nearby in a hedge. [This is not

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[669] It seems coincidental that Faversham was a centre of Madder cultivation and milling for dye in the late eighteenth century, as this would surely have involved *Rubus tinctoria* rather than *Rubus peregrina.*

[670] Antonielli, M., Ceccaelli, M. & Pocceschi (1989). *Rubia peregrina* L.: A stress resistant weed. *Environmental and Experimental Botany* **29:** 467-471.

					far from the previous site.]
Folkestone Warren	TR23N (including TR2437)	SSSI	27 February 2014	OL	(a) TR 24630 37690. Several patches in what is called the ' Scrub Garden' between the two parking areas at the end of the access road into Folkestone Warren, near to the Network Rail metal gate. Well known for a number of years. (b) TR 24351 37454. Large patch on a north facing scrub bank in an area opened up for reintroduction of cattle grazing. This patch has been known for a few years. (c) TR 24329 37391. Four patches in a *Cotoneaster* thicket on a south facing chalk grassland slope, between the road and the sea wall, Folkestone Warren. Discovered in winter 2013/14 by M. Tuson and shown to recorder.
Folkestone Warren east of Capel-le-ferne	TR23P (including TR2538)	SSSI	(1) 9 February 2019 (2) 9 June 2018 (3) after 1970, before 1981	(1) GK (2) KBRG meeting (3) Philp (1982)	(1) Scrambling through *Ligustrum vulgare* on coastal slopes. (2) TR 258 383, frequent in scrub on the undercliff. (3) TR23P.
Abbotts Cliff	TR23U (including TR2638, TR2738)	SSSI	(1) 9 June 2018 (2) 30 September 2013 (3) 1991-98 (4) after 1970, before 1981	(1) KBRG meeting (2) SB (3) EGP (4) Philp (1982)	(1) TR2638. (2) Foot of Abbots Cliff at TR 2752 3852, growing extensively through *Ligustrum vulgare*. (3) TR23U. (4) TR23U.
Samphire Hoe	TR23Z (including TR2838, TR2839, TR2939)	SSSI	(1) 16 July 2023 (2) 9 July 2013 (3) 16 August 2011 (4) 24 July 2010 (5) 26 April 2010 (6) 4 April 2010 (7) 8 May 2005 (8) 4 July 2006 (9) 1991-98 (10) after 1970, before 1981 (11) 8 July 1986	(1)SB (2) CO (3) SB (4) SC (5) SB (6) SB (7) DM (8) JP & JW (9) EGP (10) Philp (1982) (11) RoF & MJ	(1) below cliffs, eastern end of Samphire Hoe. (2) Common along old wire fence between railway and path. (3) (a) TR 28524 38816. (b) TR 29334 39211, on railway fence. (4) TR2939, spreading, at least ten or so plants. (5) TR 29764 39368, on concrete sea wall. (6) TR 28796 38956, on wire railway fence, three large plants. (7) TR 2936 3923. (8) TR2939, two colonies on fence to railway plus a few on the Hoe itself. (9) & (10) TR23Z. (11) TR 284 388, associated with *Orobanche caryophyllacea*.
Shakespeare Cliff	TR33E (including TR3039)	SSSI	(1) 5 May 2012 (2) 1991-99	(1) SB (2) EGP	(1) Clifftop at TR 30114 39537, climbing on *Ligustrum vulgare*. (2) TR33E.
Dover - Langdon	TR3342	SSSI	12 July 2010	KBRG meeting	Reported by SB as plant(s) stretching for 5 metres at TR 33403 42009.
Dover – Langdon Hole	TR34L (including TR3442)	SSSI	(1) 12 July 2010 (2) 1991-98	(1) KBRG meeting (2) EGP	(1) Reported by SB as on bare chalk edge of footpath, cut into cliff face at TR 34548 42544. (2) TR34L.
Deal	TR35Q		after 1970, before 1981	Philp (1982)	

Rumex crispus L. subsp. *uliginosus* (Le Gall) Akeroyd (Curled Dock)

vc16

Rarity / scarcity status

While *Rumex crispus* is an all-too-common agricultural weed, its subspecies *uliginosus* is a **nationally scarce** plant of estuarine mud with a limited distribution in Britain and Ireland, perhaps most extensively along the Rivers Barrow and Slaney in south-eastern Ireland; the River Fergus and other tributaries of the River Shannon in the south-west; and the Wye and other rivers flowing into the Bristol Channel. It is very scarce in the south east: the nearest to Kent are records at the Isle of Wight and in Suffolk, but it has been known on the tidal Medway. Its conservation risk assessment in England is of 'Least Concern'. If it still survives in Kent, it must be regarded as **rare**.

Account

The first record for Kent appears to be J.E. Lousley's collection of a specimen on 12 August 1934 from the mudbanks of the tidal Medway below Aylesford Bridge.[671] He first treated this (with qualification as regards the naming) as *Rumex elongatus* but after further study decided that it was *R. crispus* var. *uliginosus*. This taxon was raised to subspecific level by John Akeroyd in 1989, after which it began to be included in standard British Floras (i.e. from the first edition, 1991, of the *New Flora of the British Isles*). This should have encouraged recording, and Philp (2010) refers to it as having been noted on tidal mud in the River Medway but not mapped separately from *R. crispus* in general. This vagueness is unfortunate, as it has not been possible to trace any specific locations from Eric Philp's papers.

The BSBI database provides two records under John Akeroyd's name on 18 September 1980. One is at TR 014 616, which is Faversham Creek near The Brents, an appropriate habitat. The other is TQ 716 525, which is near West Farleigh, but well distant from the Medway, which is not tidal here anyway, so this seems doubtful.

Subspecies *uliginosus* is separated from other subspecies by its lax inflorescence when in fruit, often having long branches, and by its more or less uncrisped leaves. With subspecies *littoreus*, it has a large nut (≥ 2.5mm) and three prominent subequal tubercles. The latter probably assist the dispersal of the nuts by water. It is the earliest of the subspecies to come into flower, although plants do not normally flower in the first year, and may not do so until the third year, their resources being devoted to building up the taproot.[672] This may be another adaptation to growth in its tidal habitat, as also its height (1-2m). Akeroyd (2014[673]) refers to it as usually growing towards the upper limits of tidal influence and especially where the river banks are steep and unstable.

There are no recent Kent records and so its present status is uncertain.

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[671] Lousley, J.E. (1944). Notes on British Rumices: II. *B.E.C .Report for 1941-42*, **XII:** 547-585. Also, Lousley, J.E. (1935). Short notes on some interesting British plants. *Journal of Botany* **73**: 256-260.

[672] Akeroyd, J.R. [given as J.K.] (1980). Variation in *Rumex crispus* L. *Watsonia* **13:** 76.

[673] Akeroyd, J.R. (2014). *Docks and Knotweeds of Britain and Ireland*. Botanical Society of Britain and Ireland, Dorchester.

Rumex maritimus L. (Golden Dock)

vc15 and 16

Rarity / scarcity status

Rumex maritimus has a scattered distribution in open damp habitats (not maritime, in spite of its name) in the British Isles, but is less frequent in the west and north. Its conservation risk status in England is one of 'Least Concern', assessed on the basis of trends for the period 1930-99, but its overall historic decline is significant (32%) if post-1987 records are compared with all earlier records. It has been listed for the rare plant register as being scarce, in view of the limited number of records given in Philp (2010) and Philp (1987). It transpires that, although it is very local in the county, there are (2010-23) about three times as many tetrad locations than had been supposed; but the species is for the time being retained in the register because of its history of relative scarcity. It is a Kent axiophyte, and so is indicative of good habitat.

Bewl Water. Photo by Lliam Rooney, 30 August 2011

Account

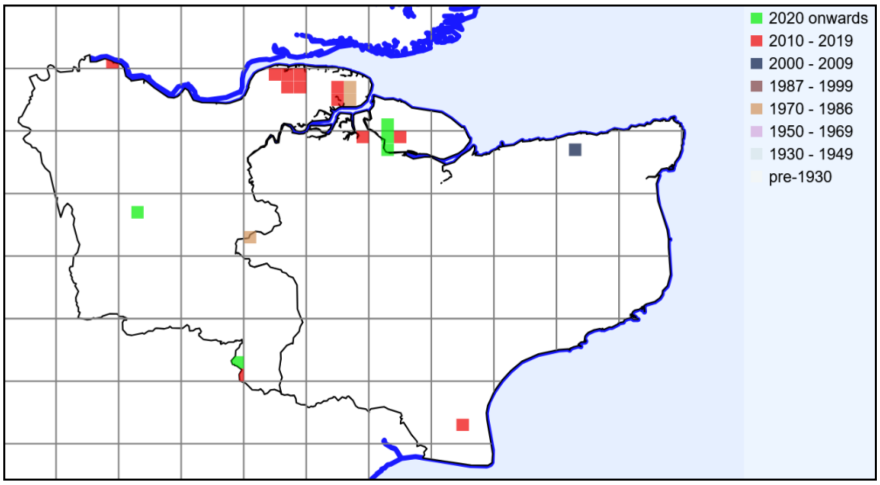
The first Kentish record appears to be by James Petiver and James Sherard. The latter made notes of a journey undertaken by them through Kent in 1715 and this manuscript was consulted for Hanbury & Marshall (1899), who give from it a record (attributing it wrongly to New Romney – it should be Hythe): 'in ye marshes betwixt the Town and Beach we met with Anthoxanthon'. (*Anthoxanthon* or *Lapathum anthoxanthum* was a pre-Linnean name for Golden Dock, with *anthoxanthum* meaning golden flower.) This record was contributed to the third edition of John Ray's *Synopsis Methodica Stirpium Britannicarum* (1724) as 'Betwixt *Hithe* and the Sea in a Pond; Mr. J. Sherard'.

There is a possibility that this record was preceded by Thomas Johnson's noting of *Hydrolapathum minus* at Erith Marshes in 1629, since the name could cover either *Rumex maritimus* or *Rumex palustris* (Marsh Dock), as Francis Rose mentions in the 1972 translation of Johnson's *Iter Plantarum* (given that *R. palustris* was still to be found there, and *R. maritimus* apparently has an 1877 record). On the whole, it is more likely that the find was *R. palustris*. Hanbury & Marshall (1899) considered Golden Dock to be scarce and very local, giving nineteenth century records for the flat marshland adjoining the Thames estuary, at Plumstead, Woolwich and Greenwich, and between Gravesend and Erith. Just too late for inclusion came a sighting by Lady Davy in June 1899 at Littlestone, showing continued presence in the south east.

Francis Rose considered it to be an extremely rare plant of alluvial marsh dikes and brackish fleets, limited to only two locations by the 1950s/60s. The first of these was at Egypt Bay in a brackish fleet where found by J. Braybrooke Marshall in 1938 and seen by Francis Rose in 1946 and 1958, when abundant. There had been other north west Kent sightings not included by him as current: Shornmead by G.M. Brown (one has to hope that this was not confusion with *Rumex palustris* which grows there) and Plumstead Marshes in 1935, which he could not re-find. The second then current location was at Marshside, Chislet, where first found by Roberts in 1955 when abundant, and where three plants were noted by Francis Rose and Trudy Side in 1962. Philp (1982) gave six tetrad records, nearly all at the edge of dikes on the estuarial marshes of the Hoo peninsula except for one which appears to relate to Teston / West Farleigh. The dock was considered to be rather rare and uncertain in appearance. Philp (2010) provided only five tetrad records for 1991-2005, again virtually all on the Hoo peninsula, at Cooling/High Halstow and Stoke Marshes, but with the dock having reappeared at

Chislet Marshes. Not included in Philp (2010), although within its survey period, was a 2004 find by Geoffrey Kitchener of six plants well inland at Greatness pits, Sevenoaks, TQ5337: they were on clay ridging by a footpath and probably brought as seed by waterfowl to the pit lakes and then spread by pumping operations (the lakes have since been infilled by refuse tipping).

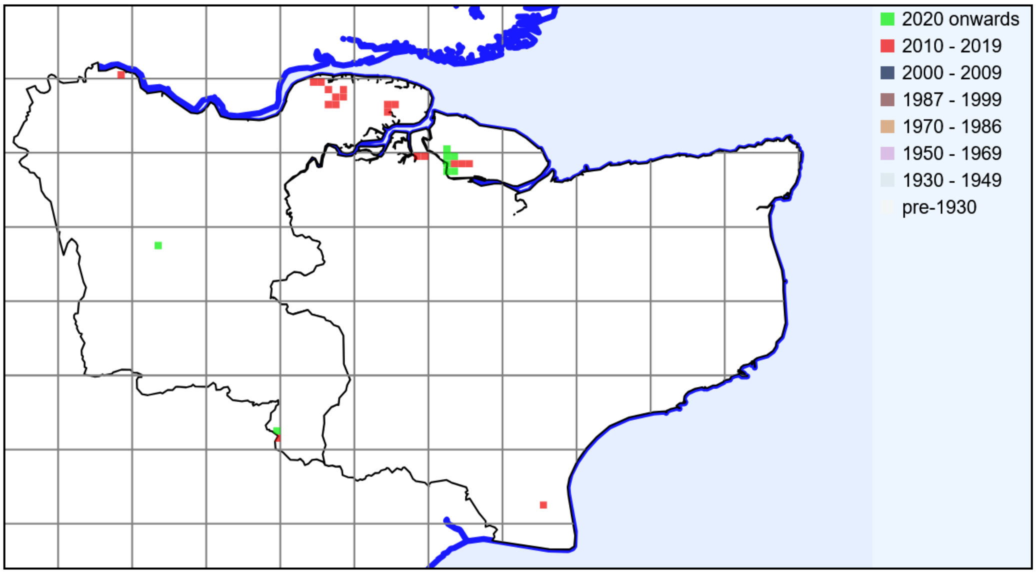
Our 2010-24 records, with 17 tetrads (27 monads) have transformed the position. Golden Dock has now been found at Chetney Marshes and, quite extensively, on the marshes of south west Sheppey. It has also appeared around a cattle-poached pond near Lydd and there are sightings which would have been outside the scope of Eric Philp's surveys because beyond the administrative county boundaries. One of these was in metropolitan vice county 16, at a dried-up water feature on a former golf course near Thamesmead; and the other was at a part of Bewl Water where the vice-county and administrative county boundaries with West Sussex differ.



***Rumex maritimus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

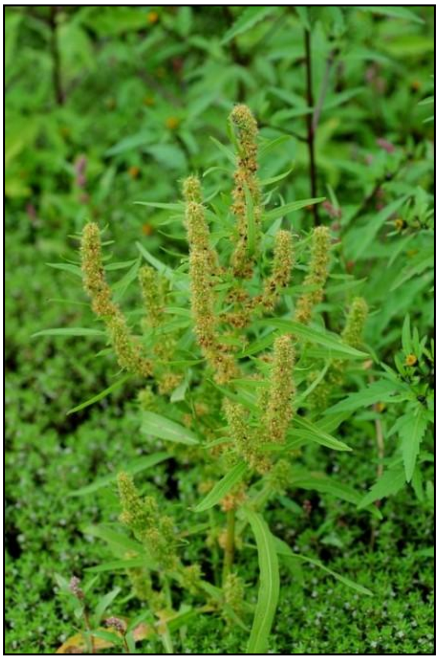
Some records are for habitats which did not exist for at least part of the earlier survey periods: the Lydd pond was not there in 1990 and only took its present shape around 2007; some of Cooling Marshes area now part of Northward Hill RSPB reserve was arable in the 1990s; Bewl reservoir was completed in 1975.

Records are displayed here at both tetrad and monad level. The former is to show the relationship with older records, which were more likely to be made at tetrad than monad level. The latter is to provide a finer resolution, in which recent records predominate because recording at monad level became the norm in Kent from 2010 onwards.



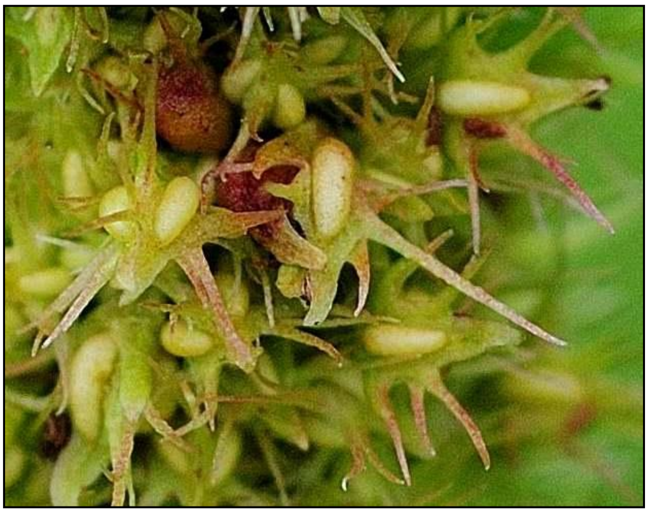
***Rumex maritimus* Kent records to 2024 mapped at monad level, from BSBI database.**

Much of the north Kent grazing marshes where Golden Dock occurs has remained a constant habitat subject to intensity of grazing, but appropriate conditions from year to year may change. It is found at the cattle-trampled edge of fleets and dikes where there is open ground, and in broad depressions and the summer-dry, sinuous rills or runnels which show the historic pattern of saltmarsh drainage before the inning of the land brought it into usage as pasture. All these exhibit fluctuating water levels and are generally inundated over winter and late into spring. The importance of winter flooding was shown by the appearance in 2014 of thousands of plants at Elmley reserve, Sheppey where grazing marsh lay under water for four months over winter, due to a broken sluice. *Rumex maritimus* is usually an annual and requires open ground for germination and establishment. Winter flooding keeps potentially competitive species at bay and grazing and tramping by cattle helps preserve the openness of the terrain; withdrawal of grazing will limit suitable conditions for the dock.



Bewl Water. Photo by Lliam Rooney, 30 August 2011

Growth is speedy, as must be the case with such a late start in the year, and flowering/fruiting generally begins well before the plant has reached full size. We have on occasion found plants growing in the water, which early in the year are interpreted as, exceptionally, individuals behaving as biennials and later in the year as overtaken by autumnal flooding. It is, however, less tolerant to complete submergence than *Rumex palustris* (Marsh Dock), and normally avoids issues of flooding through its short and rapid life cycle[674]. Typical associates are given by Mountford (1994)[675] as including *Biden*s spp. (Bur-marigolds) and *Chenopodium* spp. (Goosefoots), other annuals which also develop on wet nutrient-rich mud as it becomes exposed to water levels falling during the summer. Associates which we have noted include *Rumex conglomeratus* (Clustered Dock), *Rumex crispus* (Curled Dock), *Rumex palustris* (Marsh Dock), *Lycopus europaeus* (Gypsywort), *Samolus valerandi* (Brookweed) and, at Bewl, *Crassula helmsii* (New Zealand Pigmyweed).



Rumex maritimus acts as a pioneer species, able to colonise new habitats speedily. Seed dispersal locally will generally be by water. The fruits are buoyed by their corky tubercles and may also, through the long teeth of the tepals, be supported by water surface tension. A seed-bank may develop in mud, demonstrated by the growth of plants on dike dredgings. More widespread dispersal is likely to involve birds.

Bewl Water. Photo by Lliam Rooney, 30 August 2011

It is not likely to be confused with other species, except for *Rumex palustris* (Marsh Dock), with which it sometimes grows, e.g. at Thamesmead and Sheppey. They may be separated by general appearance: *R. maritimus* develops a golden colour when mature (although it may have brown patches): *R. palustris* becomes brown or reddish brown. The tepal teeth of *R. palustris* are shorter, as long as the tepal width; those of *R. maritimus* are 2-3 times as long as the tepal width. Papillae may be found on the leaf midrib and petiole of *R. maritimus*; they are absent from *R. palustris*.

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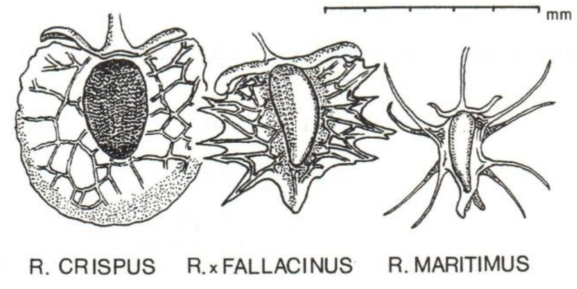
[674] Nabben, R.H.M., Blom, C.W.P.M. & Voesenek, C.J. (1999). Resistance to complete submergence in *Rumex* species with different life histories: the influence of plant size and light. *The New Phytologist* **144**: 313-321.

[675] Mountford, J.O. (1994). *Rumex maritimus* L. Golden dock, in (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

In Kent, *R. maritimus* has been found to hybridise with *R. crispus* (*R.* x *fallacinus*)[676] and with *R. conglomeratus* (*R.* x *knafii*). There are three Kent records for the former cross (1996 at Lower Stoke, 2013 at Chetney and 2021 near Elmley), which is very rare nationally.



Tepals of *Rumex* x *fallacinus* from Lower Stoke and its parents. Drawing by Geoffrey Kitchener

There are seven tetrad (nine monad) records for *R.* x *knafii* during the period 2010-22, including one atypical plant determined on the balance of probabilities: most were on the grazing marshes of the Hoo peninsula where hybrids were not infrequent in the presence of both parents, having a more etiolated and ragged panicle than *Rumex maritimus* and with tepals bearing shorter teeth.

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[676] Kitchener, G.D. (1996). *Rumex* x *fallacinus* Haussknecht – a hybrid dock new to the British Isles. *Transactions of the Kent Field Club* **15**: 39-40.

Rumex palustris Sm. (Marsh Dock)

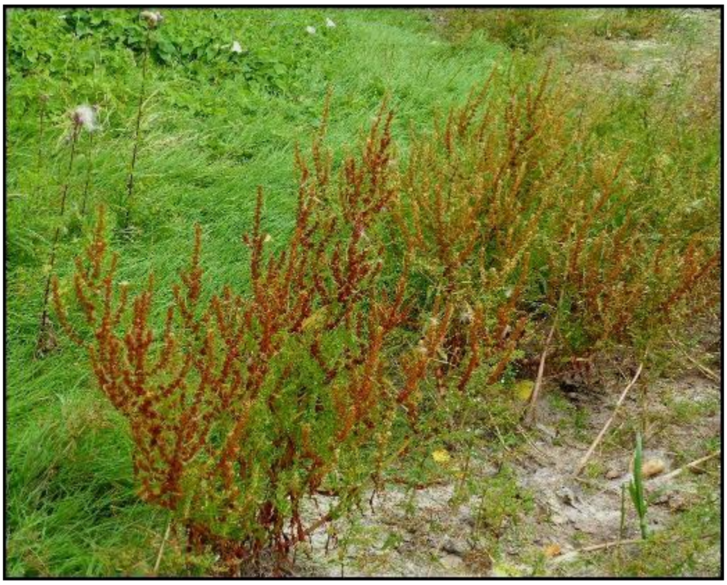
vc15 and 16

Rarity / scarcity status

Rumex palustris has a scattered distribution in open damp habitats in the British Isles, but is much less frequent in the west and north. Its conservation risk status in England is one of 'Least Concern', assessed on the basis of trends for the period 1930-99, but its overall historic decline is significant (32%) if post-1987 records are compared with all earlier records. On the basis of data in Philp (2010), it would be considered rare in Kent, but having regard to metropolitan West Kent records not covered by that survey and to more recent records generally, it is treated as verging on **scarce** in the county. It is a Kent axiophyte, and so is indicative of good habitat.

Account

The first published Kent record for Marsh Dock is to a degree ambiguous, as mentioned in the register account for *Rumex maritimus* (Golden Dock), but it is most likely that *Rumex palustris* was the identity of *Hydrolapathum minus* at Erith Marshes recorded by Thomas Johnson in 1629. He also noted this taxon in 1632, en route between Margate and Sandwich, probably near Pegwell Bay. Hanbury & Marshall (1899) treated it as a rare plant of marshy places, with records near the Thames estuary at Plumstead and Charlton, as well as a somewhat anomalous record ('On the sides of the new road from Tonbridge Town to the Wells') from Thomas Forster's *Flora Tonbrigensis* (1816)[677].



Thamesmead. Photo by Mike Robinson, 10 August 2016

Francis Rose regarded the species as a plant of bare muddy ground by ponds, and in marsh dikes, limited to the neighbourhood of the Thames (except for historic records and a 1997 sighting by a scrape west of Boulderwall Farm, Dungeness). It was present at the muddy edge of a pond by Lesnes Abbey in 1948-49; in alluvial marsh dikes at Plumstead Marshes in 1944 and 1949; in dikes, rarely, at Swanscombe Marshes in 1946 (still present at neighbouring Botany Marshes, 2022); and near Shornmead Fort, where locally abundant in 1945-46 (and still is, 2018). Philp (1982) mentions it only in three tetrads, at the edge of ponds and dikes on Shorne Marshes, with the odd plant on Dartford Marshes. During the 1991-2005 survey (Philp, 2010), however, sightings in the administrative county[678] were limited to continued regular appearances on Shorne Marshes (one tetrad) and to healthy populations about pools and ditches in two tetrads at Dungeness.

Three tetrads would warrant treatment as rare for the purposes of this register. However, 2010-24 records have been much fuller, with sightings from 11 tetrads (14 monads). Three of these tetrads were in metropolitan West Kent and so fell outside the area covered by Philp (1982) and Philp (2010): they involved sites around Erith Marshes and Thamesmead, including a dried-up water feature in a former golf course, and a record from Gallions Reach, a part of vc16 which lies on the Essex side of the Thames in the London Borough of Newham. The remaining sites included the grazing marshes and cattle-trampled dike margins of Shorne Marshes; Botany Marshes; a new site at Walland Marsh, well to the north east of earlier Dungeness records; and new sites on winter-flooded ground at Sheppey and by a brackish fleet on the neighbouring Chetney Marshes peninsula. Marsh Dock, although still scarce, now appears to be more widespread and frequent in the county than has been known at any one time before, but there is still uncertainty as regards its appearance, which relies on availability of disturbed habitat and fluctuating water levels.

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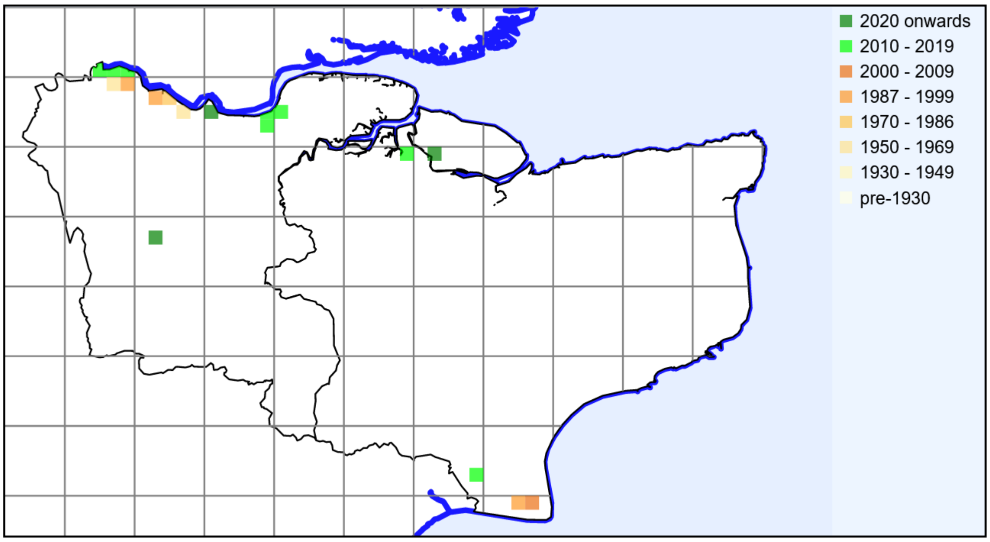
[677] They remarked that it was not given as well in Edward Jenner's Flora of Tunbridge Wells (1845), so there may be a suggestion of caution in evaluating the record. Forster noted against his species the plate from Smith's *English Botany* relating to the named plant, in this case plate no. 1932. This plate was (as acknowledged by Syme in a later edition of *English Botany*) in part drawn from *Rumex* x *pratensis*, which is a more probable find. Lousley (in Notes on British Rumices, I (1939) *B.E.C. Report for 1938* agreed that the plate did not represent *Rumex palustris*, but was a hybrid of somewhat doubtful identity.

[678] Just outside the county, however, but within vice county 16, was a record by John Palmer in 2000 by standing water on ground at Crayford Marshes, TQ 531 752, marshy in winter; it was thought probable that seeds had been brought in by wildfowl.



***Rumex palustris* Kent records to 2024 mapped at tetrad level, from BSBI database.**

It grows as an annual, biennial or short-lived perennial and its association with mud, especially cattle-trampled, exposed by seasonally receding waters enables germination to take place where there is limited competition. It is adapted to withstand rising water levels, once established, by changing its growth characteristics[679]. Within two to four hours of submergence, a plant will commence vertical orientation and growth of petioles and leaf blades and within six to eight hours the youngest leaves are almost vertical. In case the leaves do not reach above the surface, the growth of the youngest petioles is strongly enhanced in phases for several days; it reverts to normal if submergence ceases. Flooding also encourages the formation of adventitious roots enabling shoot-to-root diffusion of air.[680] These adaptations are significant for a plant which would normally need to survive flooding as a vegetative plant, in contrast with *Rumex maritimus* (Golden Dock), which would normally complete its life cycle between winter floods.

Rumex fruits floating at margin of fleet at Chetney Marshes (*Rumex palustris* arrowed). Photo by Lliam Rooney, 23 Octobe 2012.

The fruits are shed onto the soil or into water and with autumn/winter flooding may be dispersed by water movement or the wind blowing them into a scumline at the edge of a waterbody as shown in the accompanying photo (where most fruits are *Rumex conglomeratus*, but some from *Rumex palustris* are arrowed).

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[679] Voesenek, L.A.C. J. *et al*. (2003). Interactions between plant hormones regulate submergence-induced shoot elongation in the flooding-tolerant didcot *Rumex palustris*. *Annals of Botany* **91**: 205-211. Vreeburg, R.A.M. *et al*. (2005). Ethylene regulates fast apoplastic acidification and expansin A transcription during submergence-induced petiole elongation in *Rumex palustris*. *The Plant Journal* **43**: 597-610. There have been many other studies of the mechanisms relating to the responses of *Rumex palustris* to flooding.

[680] Visser, E.J.W. *et al.* (1996). An ethylene-mediated increase in sensitivity to auxin induces adventitious root formation in flooded *Rumex palustris* Sm. *Plant Physiology* **112**: 1687-1692.

Fruits may also be dispersed by birds, which appears to be the origin of plants found on dredgings from Lullingstone Castle Lake, TQ5264, in 1993 with *Bidens cernua* (Nodding Bur-marigold) and *Bidens tripartita* (Trifid Bur-marigold)[681] – none of these normally being plants of the Darent valley, but the lake is well frequented by waterfowl, which could have brought in seeds from elsewhere.

It is not likely to be confused with any other species except *Rumex maritimus* – for the differences, see under the account for that species.

Thamesmead. Photo by Mike Robinson, 10 August 2016

In Kent, *R. palustris* has been known to hybridise with *R. crispus* (*R.* x *heteranthos*) and this has been recorded in a cattle-tramped ditch at Shornmead Fort, TQ 694 747, in 2003; in a cattle-trampled area by a brackish dike at Shorne Marshes, TQ 6966 7407, in 2006; by a ditch at Elmley Reserve, Sheppey, TQ 92668 69234 in 2014; and by a cattle-trampled depression at Botany Marshes, TQ 60780 75237, in 2022. The cross with *R. obtusifolius* (*R.* x *steinii*) has a pre-1987 record in the BSBI database for West Kent, TQ47. The hybrid with *R. conglomeratus* (*R.* x *wirtgenii*) has several West Kent records, these being docks which are likely to grow together, so far as the scarcity of *R. palustris* permits: near Shornmead Fort, TQ 694 746 in 1986; occasional in cattle-trampled dike margins on Shorne Marshes from TQ 694 739 to TQ 696 741 in 1996; at Erith Marshes in the same year; near Crossness in 2000; again at Shorne Marshes, possibly on former dredgings, at TQ 6966 7407, in 2006; by The Dray near Elmley in 2021; and at Botany Marshes, TQ 60764 75249, in 2022.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Woolwich (metropolitan vc16)	TQ4379		1997	NB	TQ 4303 7929.
Gallions Reach (metropolitan vc16)	TQ4480		2010	JE	From vc16 north of the Thames.
Thamesmead east (metropolitan vc16)	TQ4780		18 July 2018	RMB	One plant on bare west edge of scrape, TQ 47987 80481.
Crossness Nature Reserve (metropolitan vc16)	TQ4781		16 August 1997	JS	TQ 476 814.
Thamesmead east (metropolitan vc16)	TQ4880		10 August 2016	MR	TQ 48112 80918 (grid ref for majority of plants), about 10 plants, at , edge of dried-up water feature part of former Thamesmead Golf Course, left to run wild after closure two or three years before. *R. maritimus* also present.
Erith Marshes (metropolitan vc16)	TQ4980	Local nature reserve	(1) 20 July 2013 (2) 17 July 2005 (3) 16 August 1997	(1) RMB (2) JP (3) KFC meeting	(1) Island Field west of bund, TQ 492 801. (2) TQ 490 802. (3) TQ 499 801, several good

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[681] Burton, R.M. (1994). Botanical records for 1993. *The London Naturalist* **73**: 191-198.

					colonies
Greatness, Sevenoaks	TQ5357		6 August 2023	GK	TQ 53479 57441, an enormous plant on damp sand by sand heap in quarry (elsewhere was *all R. maritimus*). Growing with *Polypogon monspeliensis*.
Dartford & Littlebrook Marshes	TQ57N		1971-80	JRP	
Swanscombe - Botany Marshes	TQ6075	SSSI	(1) 13 July 2022 (2) 6 July 2022	(1) GK (2) GK	(1) on grazing marshes, TQ 60779 75231, eight plants scattered at dried-out but seasonally flooded depression on clay, cattle trampled. (2) on grazing marshes, TQ 60877 75672 one plant at grassy edge to dried-out depression, heavily grazed, plus five more at TQ 60859 75664 on low short turf bank.
Shorne Marshes	TQ6973, TQ6974	SSSI	(1) 9 October 2018 (2) 29 July 2010	(1) GK (2) GK	(1) TQ 6939 7477, scattered in wet stock-trampled ditch. (2) (a) several plants on grazing marshes at TQ 69326 73993. (b) 8 plants, TQ 695 740, along cattle-trampled dike margin. (c) 13 plants at cattle-trampled dike margin TQ 696 740.
Higham Marshes north west	TQ67X (includes TQ6975)	SSSI	(1) 5 September 2012 (2) 1991-99	(1) JC (2) EGP	(1) One plant, TQ 69902 75012. (2) Shorne Marshes, TQ67X.
Shorne Marshes – Higham Common	TQ7074	SSSI	(1) 27 June 2010 (2) 23 June 2010	(1) WFS meeting (2) GK	(1) Scattered along dikes between TQ 70301 73998 and TQ 70208 74257 and TQ 70056 74162 and TQ 70102 73983, generally wherever there were cattle-trodden down areas, surprisingly frequent along last ditch given extent of shading. (2) south eastern corner of Shorne Marshes, cattle-trampled dike margins (a) one plant at TQ70280 (b) eight plants at TQ70263 74111 (c) single plants at TQ70214 74256, TQ 70195 74258 (d) two plants at TQ 70185 74258 (e) 12 plants, may include *conglomeratus* hybrids, at TQ 70109 74200.
Iwade, Cheteny Marshes	TQ8869, TQ8969	SSSI	23 October 2012	GK & LR	(a) Present along margin of waterbody at TQ 889 692 and northwestwards when not fringed with *Bolboschoenus maritimus*, to tributary channel or depression at TQ 886 695. (b) Many plants in standing water on grazing marshes at TQ 8933 6907 and neighbouring wet depressions. Also frequent at TQ 8915 6922 in wet areas together with *Rumex maritimus*. (c) TQ 89540 69246.
Minster Marshes, Sheppey	TQ9269, TQ9368	SSSI, Nature reserve	(1) 5 August 2021 (2) 31 July 2014 (3) June 2008	(1) GK, AW, LM (2) SB (3) AW	(1) TQ9269, at margin of The Dray, brackish waterbody. (2) Occasional plants by a ditch on Elmley Nature Reserve at TQ 92668 69234. The area had been inundated for several months during previous winter due to a broken sluice and this resulted in abundant growth of Rumex species. (3) TQ9368.
Walland Marsh	TQ9922	SSSI	12 July 2017	SB & OL	Four small flowering and fruiting

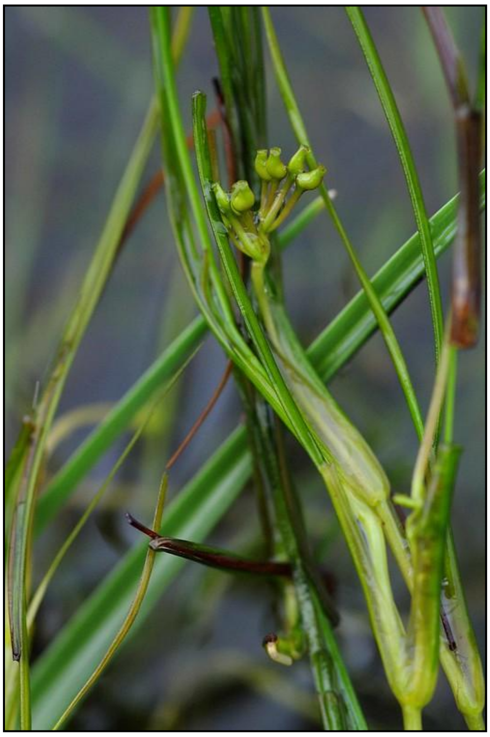
					plants in a low-lying area TQ 9952 2288.
Dengemarsh	TR01P		25 June 1998	EGP	
Boulderwall, Dungeness	TR01U (includes TR0618)		(1) 1997 (2) 26 June 1996	(1) & (2) EGP	(1) TR0618. (2) TR01U.
Lydden Valley	TR3455	SSSI	2003	CEC	TR 34270 55620, ditch 110 of Hacklinge Ditch Survey.

Ruppia maritima L. (Beaked Tasselweed)

vc15 and 16

Rarity / scarcity status

Ruppia maritima is an aquatic of brackish ditches and pools, widespread round the British Isles, but whose conservation risk assessment for England became **Near Threatened** in 2014 (although of 'Least Concern' in Great Britain) when data analysis in comparing records 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a 25% reduction in the likelihood of recording the species. It was one of many species which, although widespread in England, were showing a sufficient rate of decline as to suggest that they were at risk in the longer term. In Kent, there appears to have been a decline of 31% in the number of tetrads recorded for *Ruppia maritima* between the periods 1971-80 and 1991-2005; since then, the decline has continued and it has become **scarce**. It is a Kent axiophyte, and so is indicative of good habitat.



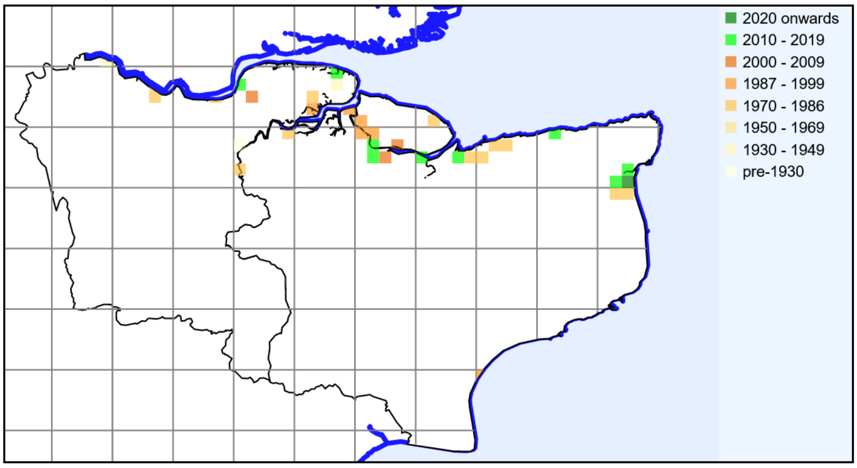
Cliffe. All photos by Lliam Rooney, 22 August 2013

Account

The first Kentish record was included by Dillenius in his third edition of John Ray's *Synopsis Methodica Stirpium Britannicarum* (1724) as one from his own observation of ditches on the Isle of Sheppey, where he saw it growing plentifully. Hanbury & Marshall (1899) described it as a not uncommon native of maritime or sub-maritime ditches and pools. They mentioned nineteenth century records for a ditch in the flats below Woolwich; near the Medway at Frindsbury and between Strood and Cuxton; salt-water ponds at Reculver; between Herne Bay and Whitstable; dikes near Faversham; ditches near Margate; between Ramsgate and Sandwich; and dikes, pools, muddy ditch and saltmarsh habitats near Dymchurch. The last location was written up at considerable length by G.E. Smith (*A Catalogue of rare or remarkable phaenogamous plants, collected in South Kent*, 1829) who had been searching for the species, which he found filling a narrow dike, with pollen scattered across the surface of the water from emergent flower spikes. He was aware of botanical opinion that pollination takes place beneath the water surface within the leaf sheaths but, wading into the dike, was unable to find any submerged flower spikes with anthers which had already dehisced within the leaf sheaths so as to achieve underwater pollination. (Surface and underwater pollination will be considered further, later in this account.)

Francis Rose's manuscript *Flora of Kent* describes the species as a native of brackish ditches and fleets: rare but locally frequent in the Thames estuary. The twentieth century records which he noted were at Stone Marshes (1945); Higham (1944); Grain (1959); Harty; Shellness, Sheppey (1956); dikes below Faversham (1945); west of Seasalter; Whitstable boating lake (1959); Swalecliffe (1950). These give no signs of continuation of presence by the Medway estuary, which figures in Philp (1982) nor of the populations near Sandwich which were also recorded in the 1971-80 survey. But the 1971-80 survey itself raises questions of continuity, for out of the 16 tetrads given in it, only one is repeated in the 11 tetrad records noted in the 1991-2005 survey of Philp (2010). Just as intriguingly, that same tetrad (at Sandwich Bay) is the only one from 1991-2005 are repeated in our 2010-24 records which are for ten tetrads (11 monads): there has been persistence here since before 1899.

The most likely explanation for the apparent lack of continuity at sites is that it is being encountered more widely, but is either being taken for *Stuckenia pectinata* (*Potamogeton pectinatus*, Fennel Pondweed), which grows in similar situations, or is being recognised as *Ruppia*, but if encountered in a vegetative state, it has not been readily capable of separation from *Ruppia spiralis* (*R. cirrhosa*, Spiral Tasselweed), so no record is being made. Failure to flower and fruit in a particular year may be a function of environmental factors such as water temperature and salinity. There is also potential for *Ruppia maritima* to move to new sites, through transmission by wildfowl (it is known as widgeongrass in North America, as supplying a food source for ducks, and the seeds can survive passage through bird gut; indeed viability and germination may be enhanced by this). A further factor in discontinuity of records seems to be a degree of variation in the extent of growth from year to year; Philp (1982) states that it is sometimes in large quantity where it is found; a corollary may be that it is sometimes not, in the same places.



***Ruppia maritima* Kent records to 2024 mapped at tetrad level, from BSBI database**

Ruppia maritima is generally described as a perennial in Britain, although in North America annual populations of estuaries where late summer drying-out occurs have been contrasted with biennial or short-lived perennials in more saline coastal habitats not so subject to desiccation[682], and it may be that whether growth is perennial or annual depends substantially on the permanence of the waterbody concerned. The species grows rooted in the substrate of its dike, pool or other waterbody.

Pollination has been widely described and may take place above or below the water level. Above, pollen is shed from dehisced anthers on the inflorescence stalk when projecting from the water surface; the stalks then recline to lie on the surface where the stigmas may come into contact with the floating pollen. Underwater pollination may be cleistogamous, where anther dehiscence takes place in flowers still enclosed in their leaf sheaths, which may also protect against desiccation where a pool is drying out. Alternatively, pollination may be achieved underwater by gas bubbles emerging from the anther sac as the anther dehisces, carrying pollen grains to the receptive stigmas of the same flower. Sometimes it has been maintained that *Ruppia spiralis* pollinates at the surface, but that *Ruppia maritima* does so below the surface. Nonetheless, it appears that *Ruppia maritima* may adopt either method, perhaps according to habitat conditions. Such conditions may encompass changing water depth and salinity. *Ruppia maritima* is supposedly more likely than *Ruppia spiralis* to be found in shallow waters (although this is not particularly confirmed by our Kentish observations) and has tolerance of a narrower range of salinity.

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[682] Richardson, F.D. (1983). *Variation, adaptation and reproductive biology in Ruppia maritima populations from New Hampshire coastal and estuarine tidal mashes*. PhD thesis, University of New Hampshire.

Both species are very similar and are best separated when in fruit. Below the stalked umbel-like head of fruits is a common peduncle which in the case of *R. maritima* is no longer than 2.6cm; that of *R. spiralis* can be 4cm long and it coils as a spiral. The fruits of *R. maritima* are 2.0-2.8mm long and asymmetrical; those of *R. spiralis* are 2.7-3.4mm long and nearly symmetrical. From *Potamogeton* (Pondweed) species they are distinguished by their fruits becoming long-stalked and their leaves not having lateral veins, only a midrib. However, this latter distinction does not help greatly in relation to *Stuckenia pectinata*, because of the indistinctness of its lateral veins, but they also differ by *P. pectinatus* having a ligule and lacking minute toothing at the leaf tip (x20 lens required).

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Stone Marshes	TQ57S		After 1970, before 1981	Philp (1982)	
Stone Marshes	TQ57T		After 1970, before 1981	Philp (1982)	
East of Shorne Marshes	TQ67S		After 1970, before 1981	Philp (1982)	
Holborough Marshes	TQ67B		After 1970, before 1981	Philp (1982)	
Cliffe Creek/Pools	TQ77D		(1) 2 August 2013	(1) SB &	(1) Dense growth in over 100

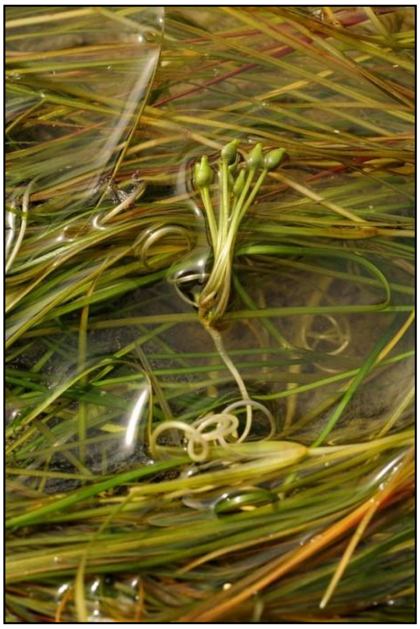
	(including TQ7176)		(2) 28 August 2003	class (2) EGP, DG	metres of coastal dike at TQ 7149 7658 with *Zanichellia palustris.* (2) TQ77D.
Cliffe, West Court	TQ77H		28 August 2003	EGP, DG	
Gillingham	TQ76Z		After 1970, before 1981	Philp (1982)	
East Hoo Creek	TQ87G		1991-98	EGP	
Stoke	TQ87H		After 1970, before 1981	Philp (1982)	
North Chetney Marshes/ Deadmans Island	TQ87W		(1) 8 July 1996 (2) After 1970, before 1981	(1)(EGP (2) Philp (1982)	
Grain, North Level	TQ8678	SSSI, MOD land	28 July 2017	BB	TQ 86556 78489, occasional.
Kingsferry	TQ96E		1991-98	EGP	
Elmley	TQ96I		1991-99	EGP	
Stray Marshes	TQ96J		1991-98	EGP	
West of Conyer	TQ96M		17 September 2001	EGP	
Rushenden	TQ97A		1991-98	EGP	
Seasalter Level	TR06S (including TR0764)		(1) 9 August 2016 (2) After 1970, before 1981	(1) AL, LR, JPu, CO (2) Philp (1982)	(1) TR0764. (2) TR06S.
Seasalter	TR06X		After 1970, before 1981	Philp (1982)	
Leysdown	TR07F		After 1970, before 1981	Philp (1982)	
Dymchurch	TR12E		1991-99	EGP	
Whitstable	TR16C		After 1970, before 1981	Philp (1982)	
Swalecliffe	TR16I		After 1970, before 1981	Philp (1982)	
Studd Hill	TR16N		After 1970, before 1981	Philp (1982)	
Reculver	TR2369		12 August 2013	CO	Fruits seen on dike behind seawall just west of private gate onto oyster farm. One patch, many seed heads.
Great Stonar	TR35J		After 1970, before 1981	Philp (1982)	
Sandwich Bay	TR25P		After 1970, before 1981	Philp (1982)	
North Stonar	TR36F (includes TR3360)		(1) 5 June 2016 (2) After 1970, before 1981	(1) SB (2) Philp (1982)	(1) Abundant in coastal dike fringed by saltmarsh plants at TR 3357 6017. (2) TR36F.
Cliffsend	TR3463	SSSI	17 July 2018	BS, MP	TR 345 637 and TR 344 636, Pegwell Bay cable route survey.
Sandwich Bay	TR36K (includes TR3461, TR3561)	SSSI	(1)28 June 2020 (2) 26 August 2013 (2) 1991-99 (3) After 1970, before 1981	(1) SB & SL (2) SB (2) EGP (3) Philp (1982)	(1) (a) Sandwich Bay, north-east of Sandwich, TR 3501 6187. Flooded dune slack (brackish) crossed by fence line. Abundant. (b) TR 350 618 abundant in brackish lagoon. (2) Margin of very shallow pool at TR 350 619. (2) & (3) TR36K

Ruppia spiralis L. ex Dumort (Spiral Tasselweed)

vc15 and 16

Rarity / scarcity status

Ruppia spiralis, which has also been called *Ruppia cirrhosa* (and in the past has sometimes been bundled under *Ruppia maritima*)[683] grows around the coasts of the British Isles, but more sparingly than *R. maritima*, and primarily on the eastern and southern coasts of England; it is **nationally scarce**. So far as concerns its conservation risk status, it is the reverse of *R. maritima*, that is to say that it is **Near Threatened** in Great Britain but of 'Least Concern' in England. The latter designation, however, masks a situation where there is less evidence of decline over 1930-99 than if 1987+ data had been compared with all records including pre-1930 data: this would show a 48% decline in England. In Kent, its status is indeed concerning: an assessment based on Philp (2010) would treat it as rare in the county, but it is probably better regarded as **very scarce**. It is a Kent axiophyte, and so is indicative of good habitat.



Plumpudding Island, fruits and spiral peduncle. Photo by Lliam Rooney, 22 August 2012

Account

The first published Kentish record for Spiral Tasselweed is likely to be its discovery by E.S. Marshall and A.H. Wolley Dod on 28 June 1893 in ditches at Port Victoria, then a railway station on the Isle of Grain. It was written up in *Journal of Botany* (1893) **31**: 249. Hanbury & Marshall (1899) refer to having been informed by Dr. Druce that there was a specimen from Sheerness in the herbarium of Dillenius; but there is some uncertainty about this, as Druce in his *The Dillenian Herbaria: An Account of the Dillenian Collections in the Herbarium of the University of Oxford* (1907) refers only to a specimen at Sheerness which he called *Ruppia rostellata*, a synonym of present-day *R. maritima*.[684] Other records in Hanbury & Marshall (1899) are from Sheppey (Harty Isle, and small ponds on the coast east of Sheerness); Seasalter; east of Whitstable; and between Dymchurch and Hythe. It was treated as rare, in ponds and ditches near the sea.

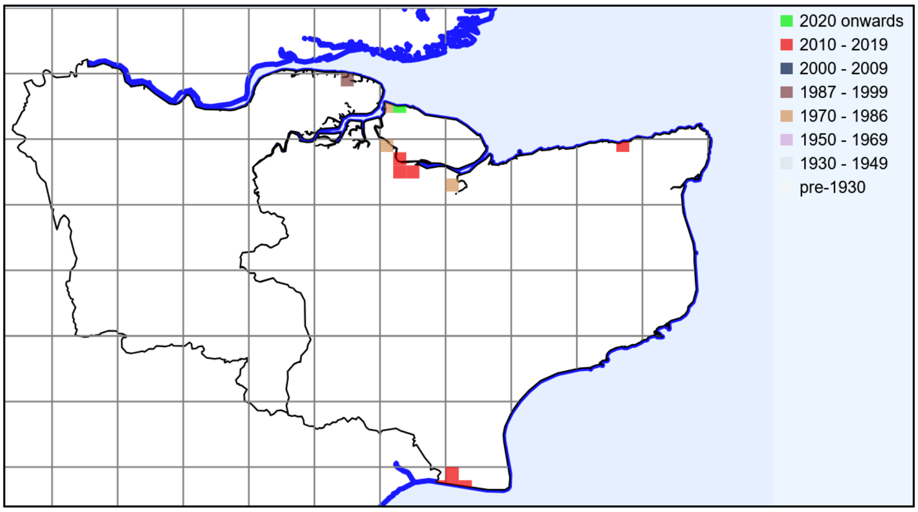
Conyer. Photo by Lliam Rooney, 3 September 2012

Francis Rose noted records from Grain (a saline pool behind the north beach, 1959); Cliffe; Sheppey (viz. Harty in 1938, Elmley, Shellness in 1956); west of Seasalter (a saline pool behind the beach, 1959, and west of the Sportsman pub); and Richborough to 1954. The general impression is one of a degree of continuity with some of the general areas where found before, and some overlap with the general areas where the more common species *Ruppia maritima* has also been recorded. In contrast, Philp (1982) mapped quite distinct distributions for both species, although finding that the differences between the species are very slight and overlap at times, giving rise to doubts about the value of retention of specific rank for both. Six tetrads were given for Spiral Tasselweed, described as rare in pools and dikes near the sea. These had declined to two in Philp (2010), one from Allhallows and the other continuing from the previous survey, at Plumpudding Island between Reculver and Birchington.

---

[683] Molecular analysis indicates that separation of *Ruppia* into two widespread species, *R. maritima* and *R. spiralis*, is not straightforward because the latter has a range of genetic variability wider than might be expected of a single species, and might better be regarded as a *R. spiralis sensu lato* complex – see Manino, A.M. *et al*. (2015), The genus *Ruppia* L. (Ruppiaceae) in the Mediterranean region: an overview. *Aquatic Botany* **124**: 1-9.

[684] This may well link up with the reference in John Ray's *Synopsis Methodica Stirpium Britannicarum* (the third edition, 1724, by Dillenius) to *Potamogiton maritimum ramosissimum grandiusculis capitulus*, abundant in ditches around Sheerness (p.150); but that work also gives with similar synonymy on p.135 *Potamogiton maritimum gramineis longioribus foliis, frustu fere umbellato,* again in ditches at Sheppey, which has been attributed to *R. maritimus* – see register account for that species. It looks as though there is an attempt here to deal with two species, but early records are difficult to assign: some standard nineteenth century Floras treat what we now know as *R. spiralis*, as *R. maritima* instead.



***Ruppia spiralis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Our 2010-24 records, however, despite that earlier apparent decline, amount to nine tetrads (and monads), so exceeding the total of six tetrads given in Philp (1982), although the sites themselves are on the whole different. Most are at Lydd Ranges, Dungeness, where there is a series of shallow lagoons in consolidated shingle, saline by virtue of seepage through the coastal shingle bank. Here, as at Plumpudding Island in north Kent, *R. spiralis* has been found growing in very shallow water, although *R. maritima* is supposed to be more tolerant of shallows. In the lagoons, *R. spiralis* has to compete with algal growth, which could limit its photosynthetic ability[685], and the waters were found to be very warm, which may be expected to encourage flowering.

Lydd Ranges, habitat. Photo by Sue Buckingham, 6 August 2012

Plumpudding Island, habitat. Photo by Lliam Rooney, 22 August 2012

The flowers, as with *R. maritima*, initially enjoy protection under water by virtue of a translucent sheathing leaf. They are brought up to the surface, where pollination mainly takes place, and the length of the peduncle, which is spiral or nearly so in fruit, varies according to water depth but generally is longer than that of *R. maritima*, as well as different in shape.

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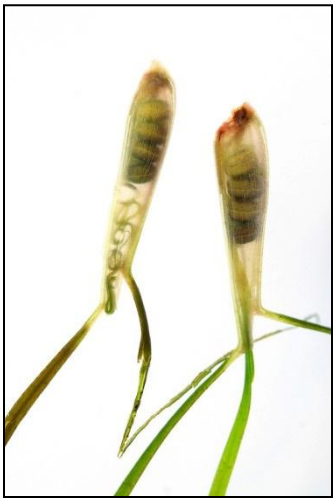
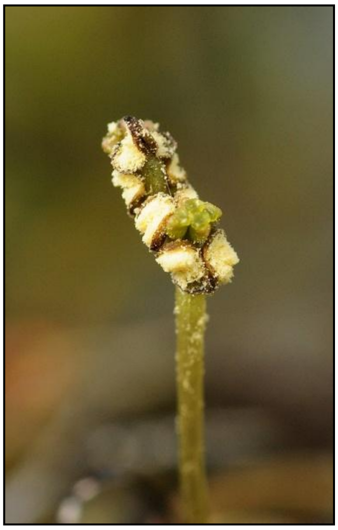
[685] There may also be anoxic effects from the decomposition of algae, and the combination of these appears to be responsible for the decay of the roots and rhizomes of *R. spiralis*, which could affect its reproductive strategy as between perennial and annual – see Mannino, A.M. & Graziano, M. (2016) Differences in the growth cycle of *Ruppia cirrhosa* (Petagna) Grande in a Mediterranean shallow system, *Plant Biosystems* **150**:1, 54-61.



As regards identification, differences between *R. maritima*, *R. spiralis* and *Stuckenia pectinata* (*Potamogeton pectinatus*) are dealt with in the account for *R. maritima.*



Plumpudding Island, emergent flower. Photo by Lliam Rooney, 22 August 2012

Conyer, sheathed flowers. Photo by Lliam Rooney, 10 September 2012

Site	Grid reference	Site status	Last record date	Recorder	Comments
Allhallows	TQ8478		9 August 1992	EGP	TQ8478.
Murston	TQ9265		(1) 30 June 2015 (2) 12 September 2012	(1) ES, AB (2) ES, BG	(1) TQ 924 656, Murston lakes. (2) TQ 928 654, TQ 924 656, TQ 924 658, Murston lakes.
Sheerness east	TQ9374		3 September 2024	AL , DP & FB	TQ 9377 7461, TQ 9352 7445. Ditch full of *Ruppia*. Barton's Point Coastal Park.
Conyer	TQ9565		3 September 2012	LR	TQ 95840 65948, small scattered patches in a dike behind the seawall near Conyer.
Jury's Gap, Dungeness	TQ9917	SSSI	7 August 2012	OL, GK, TI, SB	Saline pool at TQ 998 179.
Kingsferry	TQ96E		After 1970, before 1981	Philp (1982)	TQ96E.
Sheerness	TQ97C, TQ97H (includes TQ9374)		(1) July 2002 (2) After 1970, before 1981	(1) JP (2) Philp (1982)	(1) TQ 938 745, Barton Point Country Park. (2) TQ97C, TQ97H.
Lydd Ranges	TR0017	SSSI	(1) 9 August 2013 (2) 6 July 2003	(1) OL, GK, TI (2) SBRS	(1)(a) TR 00761 17944, shallow saline lagoon. (b) TR 00882 17972, shallow saline lagoon. (2) TR 0026 1789.
Lydd Ranges	TR0018	SSSI	(1) 9 August 2013 (2) 7 August 2012	(1) OL, GK, TI (2) OL, GK, TI, SB	(1) TR 0037 1818 and TR 0041 1806, growing in mats in shallow saline lagoons. (2) In warm shallow saline pool at TR 0022 1844
Lydd Ranges	TR01I (includes TR0217)	SSSI	(1) 6 August 2012 (2) After 1970, before 1981	(1) OL, GK, TI, SB (2) Philp (1982)	(1) In north east corner of coastal lagoon, TR 02650 17496, saline by virtue of seepage through coast shingle bank. (2) TR01I.
Lydd Ranges	TR0118	SSSI	1 November 2011	ACJ	TR 018 180.
Faversham	TR06B		After 1970, before 1981	Philp (1982)	TR06B.
Plumpudding Island, between Reculver and Birchington	TR26U (includes TR2669)	SSSI	(1) 22 August 2012 (2) 1991-98 (3) After 1970, before 1981	(1) SB, LR (2) EGP (3) Philp (1982)	(1) Completely filling a small (50 x 20 m) lagoon at TR 2665 6919, marginal plants *Phragmites australis* and *Tripolium pannonicum,* suggesting water just brackish. (2) & (3) TR26U

Kent Rare Plant Register

Species accounts Part S - Sera

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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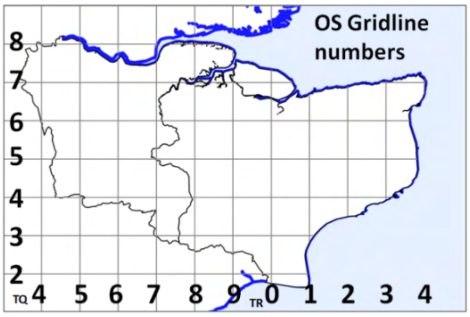
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

ACH Andrew Henderson
AGS Trudy Side
AS Mrs A. Smith
AW Tony Witts
BCE B.C. Eversham
BL Brian Laney
BW Brian Woodhams
CAS Clive Stace
CO Colin Osborne
DAB David Broughton
DC Danny Chesterman
DCa David Carey
DG Doug Grant
DJ David Johnson
DM Daphne Mills
DS David Steere
DTH David Holyoak
EGP Eric Philp
FR Francis Rose
GH Georgina Hopkins
GJ Geoff Joyce
GK Geoffrey Kitchener
HS Heather Silk
JA Jan Armishaw
JD J. Dancy
JF John Feltwell
JoA Joy Andrews
JP Joyce Pitt
JRP John Palmer
KBRG Kent Botanical Recording Group
KCS Ken Side
KFC Kent Field Club
MG Mark Gurney
MGT Mark Telfer
NB Nick Bertrand
OL Owen Leyshon
PJW P.J. Wilson
RM Richard Moyse
RMB Rodney Burton
RoF Lady Rosemary FitzGerald
SB Sue Buckingham
SC Steve Coates
SP Sue Poyser
TI Tim Inskipp

Other abbreviations and references:

BSBI = Botanical Society of Britain & Ireland	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
CGE = Cambridge University herbarium		Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
Hanbury & Marshall (1899) refers to their *Flora of Kent*		

Sabulina tenuifolia (L.) Rchb. (=*Minuartia hybrida* (Vill.) Schischk.) (Fine-leaved Sandwort)

vc 16; apparently gone from vc 15

Rarity / scarcity status

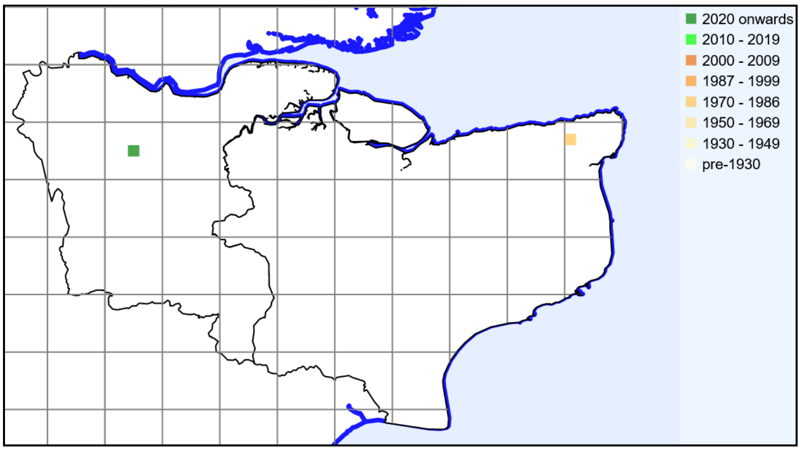
Fine-leaved Sandwort is a fairly local plant, scattered in England and Wales, largely from Hampshire through to West Norfolk. It is considered to be **Endangered**, both in England and in Great Britain as a whole. In England, the extent of its occurrence, or geographical spread, was taken to have declined by 65% in comparing records for 1930-69 and 1987-99. Also – although this did not form part of the justification for its risk assessment – it was calculated that the likelihood of finding the species had declined during this period, by 48%. It is **nationally scarce** and in Kent, it has always been **rare** and it is currently found in only one area.

Eynsford Baptist Church. Photo by Lliam Rooney, 13 May 2012

Account

The first printed reference to the occurrence of *Minuartia hybrida* (as *Alsine tenuifolia*) in Kent is in the third edition of John Ray's *Synopsis Methodica Stirpium Britannicarum* (1724, edited by Dillenius), as 'In a Close on the left Hand going down a Hill a Mile from *Deptford* [sic] towards Southfleet; Mr. *Newton*'. Deptford is evidently in error for Dartford, and the hill may have been Fleet Downs. James Newton knew John Ray, but his information was presumably not available for Ray to have included in earlier editions. Hanbury & Marshall (1899) refer to manuscript notes by Newton c.1680 in a copy of Parkinson's *Theatrum Botanicum,* giving a version of this record and referring to Darford [sic]. Puzzlingly, the historical summary in Hanbury & Marshall (1899), which was written by the remarkably erudite B. Daydon Jackson, does not refer to the annotated Parkinson as a source, but rather to an annotated copy of the second edition of Ray's *Synopsis* (1696), in Jackson's possession.

The sandwort was still in the Southfleet area, as a specimen collected by Pocock in 1825 is held at **CGE**. But on the whole, the records for Kent, both historic and recent, are few, scattered and do not seem to represent stations of long persistence. This sort of pattern seems more applicable to a series of introductions than to continued native presence, although Hanbury & Marshall (1899) considered it to be a rare native of dry sandy or chalky ground. They gave records from near Hayes; rocks at Ephraim Mount, Tunbridge Wells; from Cranbrook; and the Isle of Thanet. It is not known whether there is any continuity between the last of these (collected by Alexander Irvine, who died in 1873; but also reported by Canon Aubrey Moore, who died in 1890) and a 1963 find by Miss B. Nash near Acol, Thanet. Her discovery was on a high north-facing wall at Cleve Court, TR3166, where it survived long enough to be recorded for Philp (1982).

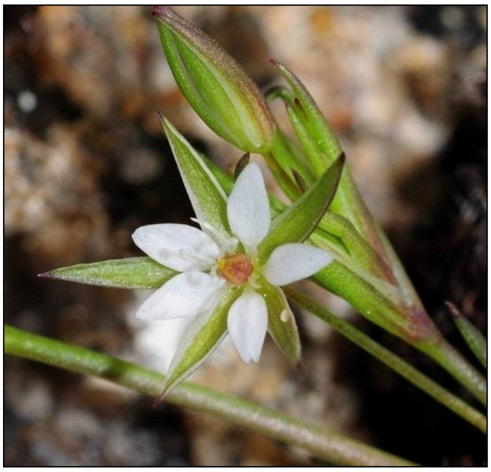


Sabulina tenuifolia **Kent records to 2024 mapped at tetrad level, from BSBI database.**

The status of *Sabulina tenuifolia* as a current Kent species rests on populations found at Eynsford by Rodney Burton. In 1994, he discovered a substantial population on the mediaeval flint walls of Eynsford Castle. Factors which may have favoured its appearance and a great increase in *Saxifraga tridactylites* (Rue-leaved Saxifrage) were disturbance caused by maintenance work and also the cessation of herbicide spraying. In May 2012 there were some 130 plants, of which at least 110, mostly tiny, were on the north west side of the hall ruin, from TQ 54164 65839 to TQ 54164 65837. Other locations included 2.5m above the bottom step up from the solar undercroft (TQ 54165 65871) and three metres above ground in an opening of the curtain wall at TQ 54150 65797. There were no plants on the north west side of the curtain wall. In April 2013, there were about 320 plants, spread over many parts of the castle; it was still present in 2016 and in February 2018 seedlings were suddenly frequent on the south side of the gatehouse, although two months later most of these seedlings had been smothered by rapid growth of *Anisantha ste*rilis (Barren Brome). Only one plant was seen in 2019, but there was a good showing on the castle in 2020. Early growth of this annual places it at risk, as its abundant seedlings were completely eliminated by severe frosts in late February 2021.

Eynsford Castle. Photo by Lliam Rooney, 13 May 2012

In April 2007, Rodney Burton found a further site, 90m to the south east, on the flint and brick boundary wall south west of Eynsford Baptist Church. The sandwort appeared to have arrived within the preceding three years, and was already densely massed along about four metres of the wall. On 9 May 2012, he recorded c.400 plants on the top and the south west wall face along five metres centred on TQ 54235 65737; and on 25 May, a further c. 650 plants along the north east side from TQ 54233 65741 to TQ 54241 65735. Populations fluctuate from year to year: in July 2013 only 90 plants were seen on the wall, and no *Saxifraga tridactylites*; but in July 2016 it extended along the front wall. In June 2019 it was still plentiful along the north east side of the wall and in 2020 it germinated well there, except for smaller seedlings, which were smothered by *Saxifraga tridactylites*.



Eynsford Baptist Church. Photo by Lliam Rooney, 13 May 2012

The natural habitat of *Sabulina tenuifolia* is supposed to be dry, weathered calcareous rocky slopes[686], but the data on previous Kent sites are insufficient to identify habitat corresponding to this, and the historic record for rocks at Mount Ephraim suggests wider tolerance, as the Ardingly sandstone outcrops are acid in nature. The mortar of walls provides an artificial proxy for its natural habitat. This habitat preference is shared with species such as *Galium parisiense* (Wall Bedstraw) and

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[686] J.O. Mountford (1994). *Minuartia hybrida* (Villars) Schischkin. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce plants in Britain*, JNCC.

Saxifraga tridactylites, although only the latter appears to have a degree of association. *Sabulina tenuifolia* is an annual, and population fluctuations presumably indicate unfavourable conditions for germination or growth. The longer term risks for the species are likely to be any need to repair or re-point its walling, or any wish to do away with wall vegetation generally.

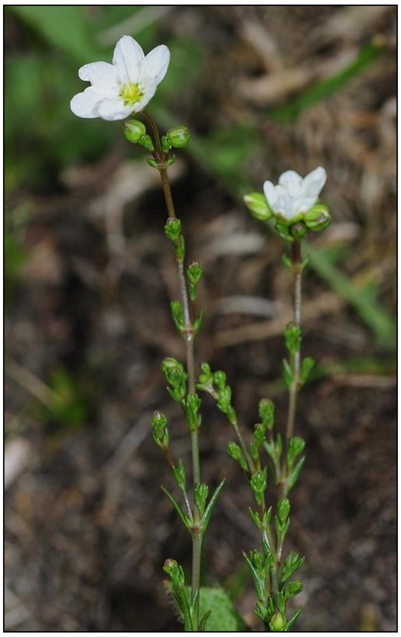
It is unlikely to be confused with anything other than the much more common *Arenaria serpyllifolia* (Thyme-leaved Sandwort) or *Arenaria leptoclados* (Slender Sandwort). The latter two, however, have ovate (rather than linear) leaves; and *Sabulina tenuifolia* is more upright in habit.

Sagina nodosa (L.) Fenzl (Knotted Pearlwort)

vc 15

Rarity / scarcity status

Sagina nodosa is widespread in the British Isles, other than in southern parts, and grows on damp, rather open sandy and peaty soil, often with some calcareous influence. Losses of open calcareous habitat may have contributed to its southern decline, and it is considered to be **Vulnerable** to the risk of extinction in England. This risk assessment is based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 39% and its area of occupancy had declined so that there was a calculated 36% reduction in the likelihood of recording the species. In Kent, although now rediscovered near Sandwich, to add to its Dungeness/Romney presence, it remains **very scarce** indeed, as it has long been. It is a Kent axiophyte and so is indicative of good habitat.



Sandwich, golf course. Photo by Lliam Rooney, 20 July 2011

Account

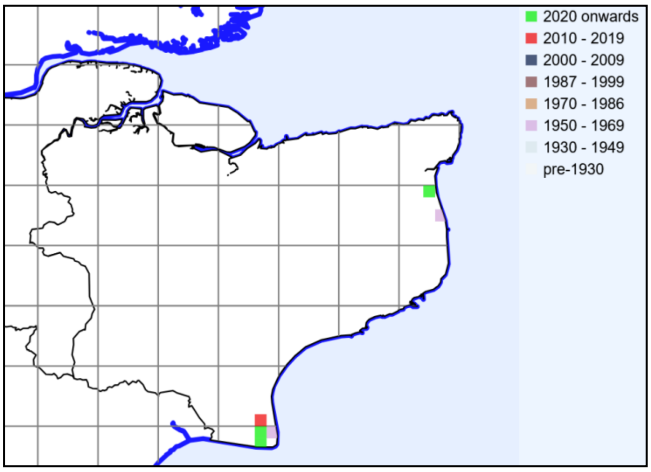
The first trustworthy records for Knotted Pearlwort are likely to be those by G.E. Smith in his *Catalogue of rare or remarkable phaenogamous plants, collected in South Kent* (1829), where he refers to it growing ‘Upon the Warren at New Romney; about Lydd: upon the sand-hills, Sandwich. Upon a sand bank east of the Ivy Cottage, at Sandgate’. However, ‘Knotted spurry’ had been claimed as ‘in the brooks near Margate’ by Dr. R.E. Hunter, who listed it in *A short description of the Isle of Thanet; chiefly intended as a Directory for the company resorting to Margate and Broadstairs* (1796), but this ‘popular’ work is known to have many botanical errors. This site might have been possible for *Sagina nodosa*: the Brooks was a mere, some 300 yards across where facing the sea, and it occupied the low ground of Margate south of The Bay, as far inland as what is now Tivoli Park. It silted up and became marshy ground with a sand bar seawards, and if there was damp sandy ground with calcareous influence from the Margate chalk, then perhaps there was suitable terrain. Matthew Cowell (*A Floral Guide for East Kent etc.,* 1839) gave the species as common in Thanet, from Hunter’s manuscripts, which as a broad statement seems unlikely given the absence of other appropriate habitat, but George Pittock listed it in his *Flora of Thanet* (1903) as well.

Sandwich, golf course. Photo by Lliam Rooney, 20 July 2011

Hanbury & Marshall (1899) wrote that it was a native of ‘Sandy or gravelly ground, preferring spots liable to be overflowed in winter; very local’. The sites of which they knew included the shingle between Great and Little Stonar, Ham Brooks, between Deal and Sandwich, and a saltmarsh near Romney.

Dungeness, habitat (path to Hanson Hide). Photo by Owen Leyshon, October 2011

Francis Rose described it as of ‘Dune slacks and shingle hollows, liable to be wet in winter; now very rare’. He found it in a dune slack ½ mile south of Shellness, Sandwich in 1946, where it was rare and he was unable to re-find it since. However, it was reported by Mrs Brickenden as abundant near Downs Farm, Sandwich in 1962. He also knew it in dune slacks at Greatstone from 1947 to 1950, where it was locally abundant; and E. Scott reported it in damp shingle lows, where quarried, at Dungeness in 1953 (it has been known near the Dungeness gravel excavations at least back to 1937). These two areas, Sandwich and Dungeness, have been the focus of records since. Philp (1982) recorded it only in two tetrads in the Deal-Sandwich area; it could not be re-found at Dungeness. Philp (2010) recorded it at both areas, but in one tetrad each.



***Sagina nodosa* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Our 2010-24 records from the BSBI database amount to four tetrads (six monads), and are still in the same two general areas, although we are also aware of presence claimed at Romney Warren its original site. At Dungeness it has been noted as growing on sand and shingle, generally on disturbed ground, as by paths, tracks, roadsides and a car park. At Sandwich, it has also been seen at pathsides and disturbed ground, its substrate being peat and sand. Its soils are infertile, probably slightly saline, and it is possible that there is some calcareous influence at both locations, from shell fragments. We do not have information regarding associated species for these records, although the accompanying photograph shows the presence at Sandwich of *Achillea millefolium* (Yarrow) and *Euphrasia* sp. (Eyebright).

Sagina nodosa is generally regarded as a pioneer species of the early stages of dune slack development; it may be that its pathside appearances at Sandwich are a consequence of disturbance of a seed-bank from past, more open dune conditions, more plants were found in 2021 in damp bare sandy conditions arising from pool excavation and scrub clearance [687] We have no varietal information in Kent, although it looks as though var. *nodosa* is our plant (var. *moniliformis* would have procumbent stems and the ability to propagate vegetatively from bulbiferous 'knots' dropping from the stems).

Sagina nodosa is readily recognised by its relatively large flowers, the five petals being twice the length of their sepals, and its leaves clustered in 'knots' up the stem.

Sandwich, golf course. Photo by Lliam Rooney, 20 July 2011

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Dungeness – Pen Bars	TR0617	SSSI	14 July 2024	SB	Sandy pathside at TR 06523 17974, on RSPB reserve.
Dungeness	TR01U (includes TR0618 and TR0619)	SSSI	(1) 1 August 2019 (2) 17 June 2016 (3) 27 July 2014 (4) 5 August 2012 (5) 25 July 2012 (6) 24 July 2012 (7) 7 September 2011	(1) AW (2) DS (3) JP (4) BW (5) SB (6) CO (7) DJ (8) SB	(1) TR0618. (2) TR0619. (3) Frequent in thin disturbed grass, RSPB reserve car park area. (4) TR0618. (5) Abundant on shingle by track at TR 0652 1847. (6) Around track from Dungeness

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[687] Cf. Plassmann, K. *et al.* (2009). Can soil banks contribute to the restoration of dune slacks under conservation management? *Applied Vegetation Science* **12**: 199-210.

			(8) 20 August 2011 (9) 28 August 2010 (10) 25 July 2009 (11) 28 July 2000	(9) MG (10) JP (11) EGP	Road to railway c. TR 063197 (7) TR 0694 1960, c.50 plants at side of path to the Hanson Hide. (8) 20 - 30 plants on sand and shingle roadside TR06229 19697. (9) TR0618. (10) TR 065 185, on bare sand in ARC Pits area. (11) TR01U.
Dungeness (Water Works)	TR0620		(1(17 July 2016 (2) 8 August 2012	(1) DS (2) SB, TI	
Dungeness (N of Denge Beach)	TR0719	SSSI	(1) 28 August 2010 (2) 28 June 2010	(1) MG (2) TI	
Dungeness	TR0816	SSSI	(1) 23 July 2011 (2) 30 August 2008	(1) DM (2) DM	
Romney Warren	TR0825, TR0826	SSSI	(1) 5 June 2010 (2) 7 July 2002	(1) JS (2) BW	(1) TR 0876 2614. (2) c. TR 086 252, Littlestone golf course.
Pegwell Bay	TR3416	SSSI	22 June 1998	JS	TR 341 632.
Sandwich Bay	TR35P (includes TR3559)	SSSI	(1) 18 August 2023 (2) 2 August 2021 (3) 27 June 2021 (4) 23 May 2011 (5) 24 June 2010 (6) 28 July 2007 (7) After 1990, before 2006	(1) SB (2) SB (3) SB (4) SB (5) SB (6) DG, EGP (7) Philp (2010)	(1) This year many flowering plants all around the margin of the pool on the practice range from TR35097 59246 to TR35130 59147. (2) At least 100 flowering plants in a damp grassy area beside the old practice range between TR 35176 59224 and TR 35130 59309. and at least 40 more plants on damp bare sand around the margin of a pool which was dug in 2019 from TR 35104 59183 to TR 35113 59195 (3) 4 plants on Princes practice range at TR35132 59311 and one at TR35129 59313 in a small hollow on a bare peat and sand mix, about 12 ins below the surrounding grassland. It seems that the depression was created from disturbance during recent scrub removal. Associate plants: *Juncus bufonius, Ervum tetraspermum* and *Pulicaria dysenterica*. Plants just beginning to flower. (4) Many plants on sand and peat, scattered along 30 metres of pathside from TR 35174 59205 to TR 37135 59260. (5) TR 35160 59222, One plant, peat and sand pathside on Prince's Golf Course, old practice range. (6) & (7) TR35P.
Sandwich Bay	TR35Q, TQ35S		After 1970, before 1981	Philp (1982)	

Habitat, recently excavated pool at Sandwich, golf course. Photo by Sue Buckingham, 02 August 2021

Salicornia disarticulata Moss (*S. pusilla* Woods) (One-flowered Glasswort)

vc 15; probably still in vc16 although not seen recently

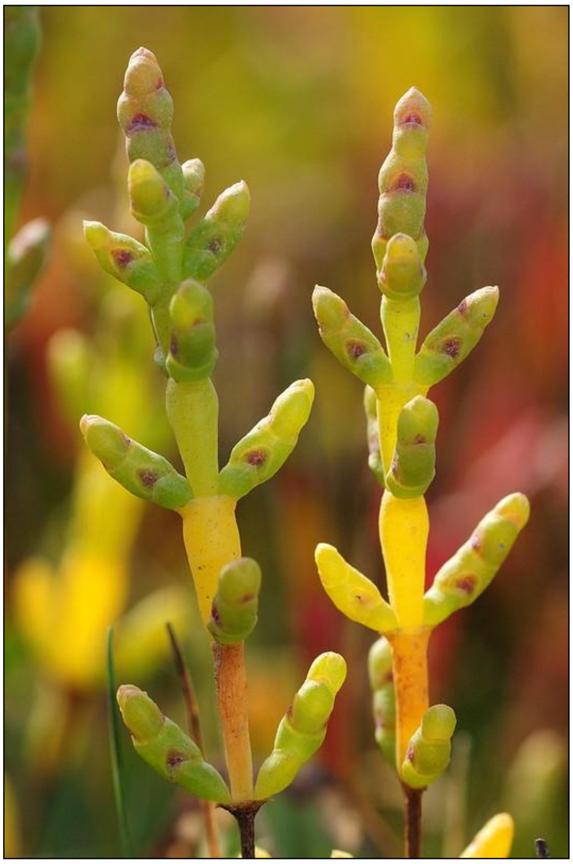
Rarity / scarcity status

Salicornia disarticulata is a succulent, salt-tolerant annual of saltmarshes in southern parts of the British Isles, with its main distribution in south Wales, Hampshire and East Anglia down to north Kent. It is a **nationally scarce** species and one whose conservation risk status is regarded as of 'Least Concern'. However, this assessment of risk is based on the level of decline in records for the period 1930-99, which did not reach a level of least 30% (qualifying for Vulnerable status); but if 1987+ data were considered against all records, including those before 1930, a decline of 33% would have been shown. In Kent, there is some evidence of decline (35%) between the periods 1971-80 and 1991-2005, but not since, except as regards an absence of post-2000 records for the Hoo peninsula. Whilst local, it is neither rare nor scarce in the county. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first record of this species in Kent appears to be a pressed specimen in **CGE**, collected by E.S. Marshall at New Romney on 17 September 1891 (det. P. Sell). Marshall was evidently taking an interest in *Salicornia* spp. at New Romney in 1891 as there is a long account by him in Hanbury & Marshall (1899) regarding a plant on the muddy flats near Great Stone which he named as *S. appressa.* However, there is no mention there of any one-flowered glasswort, in spite of the 1891 gathering. On the other hand, Marshall (1915[688]), in writing up a prostrate form of *S. disarticulata* from Devon, which he named as var. *humifusa*, referred to his 1891 '*S. appressa*' plant as probably the same as a prostrate form of *S. disarticulata* seen by Dr C. Moss in both Brittany and England.

Subsequently, Francis Rose assessed *S. pusilla/disarticulata* as locally frequent in the Thames, Medway and Stour Estuaries and noted records from Frindsbury, 1945 (the BSBI database credits A.J. Willmott as the first finder for vc16, West Kent here); Grain, 1948; Funton Creek, 1962; Conyer Creek; Faversham Creek (Nagden); Elmley, 1950-54; Harty, 1945-63; Shellness, Sheppey, 1949-63; Whitstable, 1926 (by G.C. Druce); Castle Coot, 1960-62; and Shellness at the mouth of the River Stour, 1954.



Oare. Photo by Lliam Rooney, 22 September 2010

Records in Philp (1982), covering the 1971-80 county survey, showed no sign of the earlier New Romney and Shellness (Stour) presence, but gave 23 tetrads for upper saltmarshes in the Swale and Medway estuaries and just edging round Grain to the Thames estuary. Whilst the 1991-2005 survey (Philp, 2010) gave only 15 tetrads in the same area of distribution, it is possible that the ostensible decline relates to the practicalities of recording: the window of recording is effectively late September to mid-November and some of the saltmarshes are remote and difficult to access. Those considerations may also apply to 2010-24 recording, which has produced 20 tetrads (32 monads). However, 2010-24 recording has been successful in confirming continued presence at the mouth of the River Stour and, although no longer at New Romney, the species has been found in two sites at Dungeness. Mapping here is given at both tetrad and monad level, the former showing historic tetrad records, the latter giving finer resolution and omitting older records as monad recording only became the norm in Kent from 2010.

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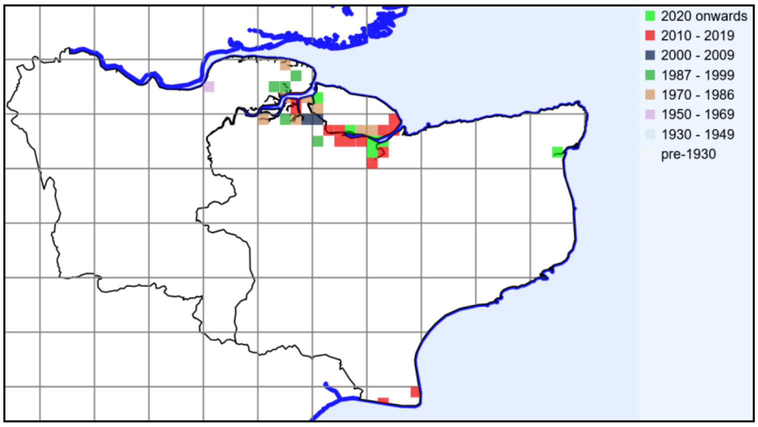
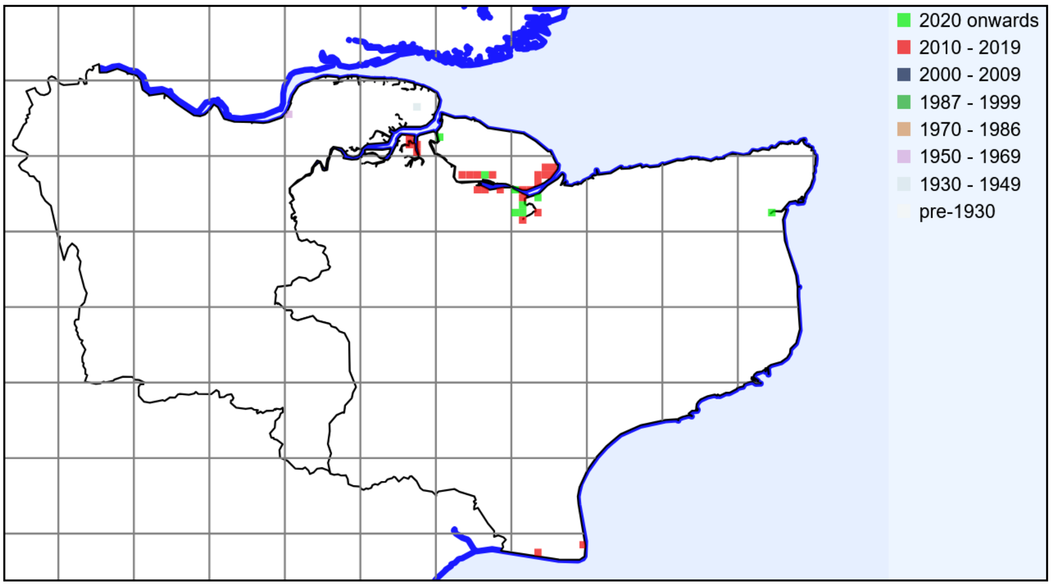
[688] Marshall, E.S. (1915). A new Salicornia variety and hybrid. *Journal of Botany* **53**: 362-363.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Salicornia disarticulata **Kent records to 2024 mapped at tetrad level, from BSBI database.**

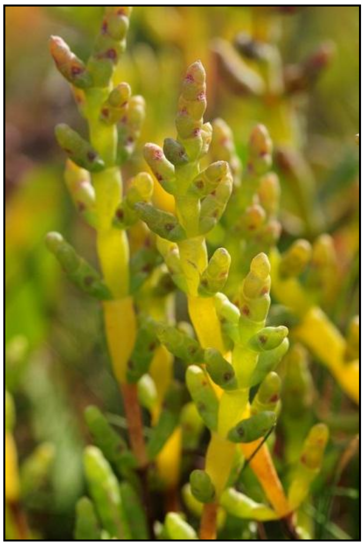

2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Salicornia disarticulata **Kent records to 2024 mapped at monad level, from BSBI database.**

The limits to its presence are of course the availability of suitable saltmarsh. At Dungeness, the habitat is relatively unusual for Kent in that it is landward of the sea wall or shingle banks, which are penetrated by saltwater seepage. Elsewhere in the county, the norm appears to be saltmarshes which are subject to direct tidal influence and which lie seaward of any coastal or estuarial defences.

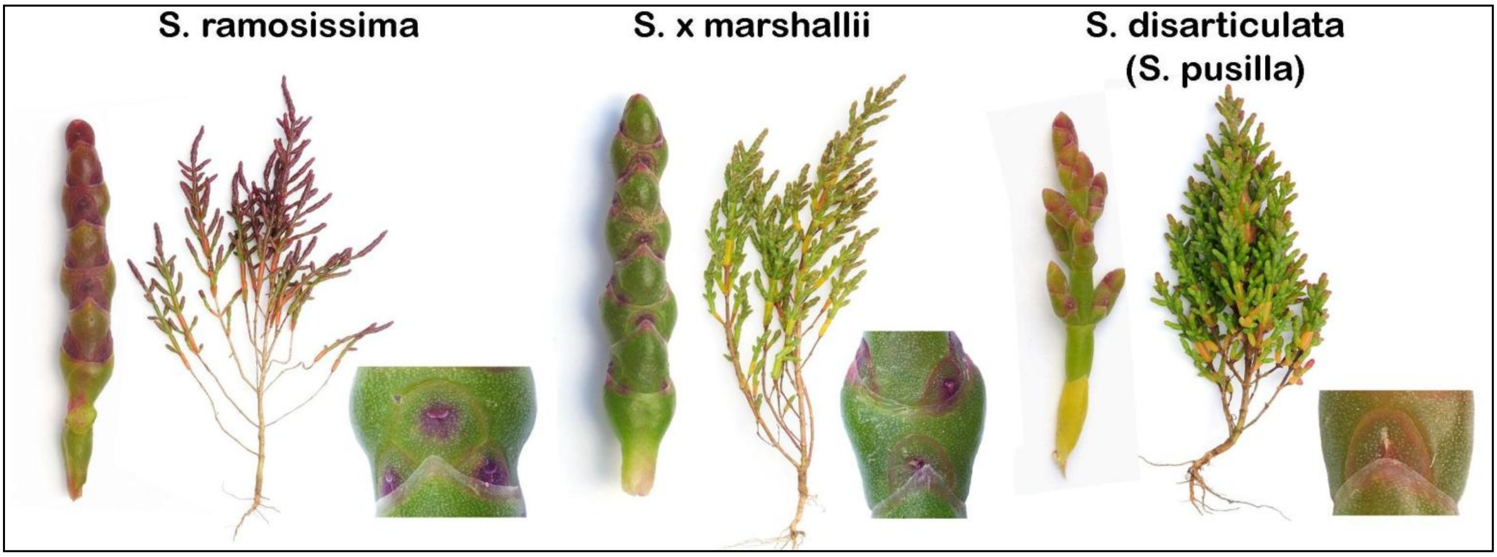
Oare, habitat. Photo by Lliam Rooney , 16 October 2018

Typically, *Salicornia disarticulata* is to be found on the higher and drier parts of saltmarshes, just around or slightly above the level of normal tides; often growing on open flat areas, sometimes surrounding small shallow pools. Such areas are without heavy cover of *Atriplex portulacoides* (Sea-purslane), and associated species are *Puccinellia maritima* (Common Saltmarsh-grass) and *Salicorna ramosissima* (Purple Glasswort).



Oare. Photo by Lliam Rooney, 22 September 2010

One-flowered Glasswort is, unsurprisingly, readily recognizable by its single flowers (cymes). Other British glassworts have their flowers, when fully developed, in groups of three. Occasionally, Kent plants have been found with flowers in a mixture of ones, twos and threes. Where this mix can be seen not to a consequence of an early stage of development in which flowers in groups of three have not fully emerged with expansion of the spike or branch segment, then it can be concluded that this is *Salicornia x marshallii*, a hybrid between one- and three- flowered species (*S. disarticulata* x *ramosissima*). This is mentioned as known in East Kent by Dalby (1975)[689] and it was reported at Bedlams Bottoms, Iwade, TQ86Z, by Geoff Smith, although not included in Philp (1982). The first recent record was by Lliam Rooney, near Oare, in 2010, after which, with the benefit of annual *Salicornia* expeditions by the Kent Botanical Recording Group, Kent botanists have become accustomed to its recognition and it has been seen in 12 monads in the period 2010-23. It is named after the *Flora of Kent* co-author, E.S. Marshall, who first described the hybrid, from Devon, as a cross between *S. disarticulata* and *Salicornia smithiana* (since treated as subsumed into *S. ramosissima*). Hybrids may arise as first generation through wind pollination between the parents, or as a subsequent generation since hybrids are fertile, varying but generally closer to *S. disarticulata* in appearance.[690] Both parents and hybrid are annuals.



From Glassworts crib sheet prepared by Lliam Rooney from Kentish specimens

Other characteristics of *S. disarticulata* are its yellow-green colour, becoming brownish- or pinkish-yellow (grey-green in an occasional prostrate form[691]); the fairly short terminal spike and side branches; also, the

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[689] Dalby, D.H. (1975) Salicornia L. in (ed.) Stace, C.A., *Hybridization and the Flora of the British Isles*, BSBI/Academic Press, London.

[690] Salicornia L., in Stace, C.A., Preston, C.D. & Pearman, D.A. (2015). *Hybrid Flora of the British Isles*, BSBI, Bristol.

[691] D.H. Dalby (1994) Salicornia pusilla J. Woods. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough.

plant disarticulates (cf. *disarticulata*) when the fruit is ripe, so that the branches with their fertile segments become detached and settle on the ground or are moved by the tides elsewhere. The segments with their seeds may float in sea water for up to three months and are characteristically deposited on high points.[692] It is perhaps the easiest *Salicornia* species to identify because of its single flowers; otherwise the boundaries between the species are often difficult to identify in view of their plasticity, the differentiation within a species of inbreeding populations and the general lack of discontinuities in the range of variation between the various taxa.

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[692] Dalby, D.H. *(*1963*)* Seed dispersal in *Salicornia pusilla. Nature* **199:** 197–198*.*

Salicornia emerici Duval-Jouve (*Salicornia nitens* P.W. Ball & Tutin) (Shiny Glasswort)

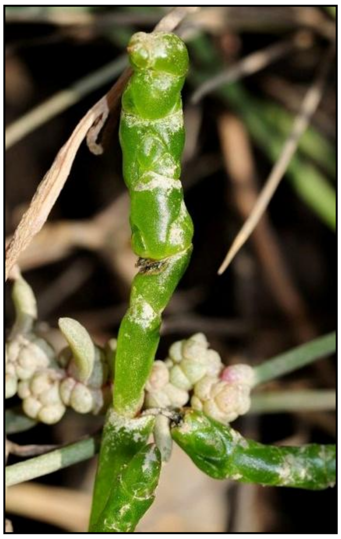
vc 15

Rarity / scarcity status

Salicornia emerici has a very sparse distribution in saltmarshes around the coasts of the England, Wales and Eire, being **nationally rare**. It appears in the *Vascular Plant Red List for England* as data deficient, that is to say, it is believed to have very restricted populations and is possibly threatened, but sufficient information is not available on which to conduct a threat assessment. Until 2020, it had only been found once in recent years in Kent, but in that year two colonies were located. It is accordingly to be regarded as **rare** in the county.

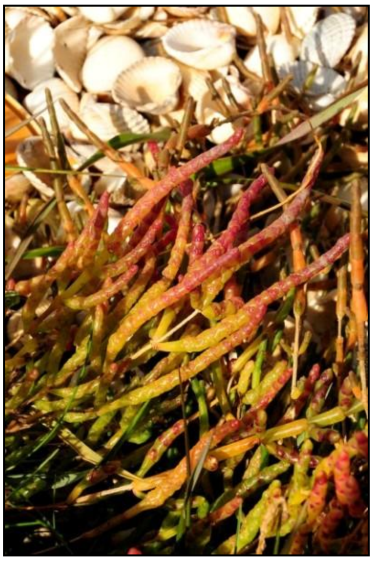
Account

Shiny Glasswort does not feature in Hanbury & Marshall (1899), Philp (1982) or Philp (2010). The earliest records appear to be ones in the BSBI database for TR06 and TQ96 within the period 1950-69, but they lack any details by which they may be assessed. There is, however, an entry in Francis Rose's manuscript *Flora of Kent* as regards a find (as *Salicornia nitens*) in saline meadows by Fairfield Church, TQ 986 264, by Mrs. K.D. Rowlands in 1962, det. T.G. Tutin. Whilst this is an inland location on Romney Marsh, over 12km from the coast, historic marine transgressions have rendered this an anomalously saline site, with a range of salt-tolerant species present.



Oare. Photo by Lliam Rooney, 5 October 2011

After a gap of some decades, the species was seen again in Kent, this time in the uppermost saltmarsh, close to the sea defence embankment, east of the Oare Marshes KWT reserve, TR0164, where Faversham Creek opens onto the Swale. The find was made in the course of a KBRG meeting on 5 October 2011 and was determined by Eric Philp. It was a single plant, growing in an area which was not particularly open, amidst *Suaeda maritima* (Annual Sea-blite) and *Atriplex portulacoides* (Sea-purslane)



On 11 September 2020 a colony of at least 20 plants was found nearly 2km eastwards, at Castle Coote, TR 03422 67439, by Lliam Rooney and Caroline Ware, subsequently (23 October) viewed and confirmed by Fred Rumsey as well. The site is a shingle spit, largely shell-sand, projecting into the Swale channel with associated saltmarsh, and the plants were growing exclusively at the end of the saltmarsh against the shelly shingle.

Castle Coote. Photo by Lliam Rooney, 23 October 2020

Then, on 25 October 2020, Lliam Rooney identified a further, small colony growing west of Faversham Creek, on the upper saltmarsh bordering the Swale north of Uplees Marshes, Oare at TR00228 65510. It was found near a saline pool in a mixed population of diminutive *Salicornia ramosissima* (Purple Glasswort) and *Salicornia europaea* (Common Glasswort). From a distance it resembled a more slender form of *S. ramosissima*, being of a similar colour, with extra long terminal spikes, but on closer inspection showed fertile segments and cymes in keeping with the tetraploid *Salicornia procumbens* group. Later measurements showed lower fertile segments were within the range of *S. emerici* (see final illustration in this account).

Habitat, Uplees Marshes, Oare. Photo by Lliam Rooney, 25 October 2020

The sum of these investigations therefore points to *S. emerici* probably having a persistent, but overlooked, presence on the saltmarsh bordering the Swale on either side of its confluence with Faversham Creek.

S. emerici is generally considered to be a plant of bare mud and salt pans on saltmarshes (Ball & Tutin).[693] Little information about its British ecology seems to be available, although a 2015 Essex record mentions the habitat as being flat beach. (See below for extrapolations from French ecology.)

Identifying this species, as with *Salicornia* generally, is made difficult by a degree of overlap of characters between taxa. Its spikes have flowers (cymes) in groups of three, each more or less the same size, and the fertile segments are fairly straight-sided, rather than distinctly convex, so that the spike is cylindrical, not beaded: this places the species in an aggregate called *Salicornia procumbens*. This aggregate also includes *Salicornia fragilis* (Yellow Glasswort) and *Salicornia dolichostachya* (Long-spiked Glasswort). From these, *S. emerici* is distinguished by nearly always having fertile segments not more than 3mm long; being little-branched (whereas the other species are often much-branched); having a terminal spike normally not exceeding 40mm[694] (the other species are often much larger); and by being treated in Britain as initially green, then becoming brownish purple/orange with a slight or diffuse red tinge (the other species generally become yellow or yellow-brown). The name Shiny Glasswort also points to its smooth, shining, somewhat translucent appearance; but in practice this may be obscured by tidal mud.

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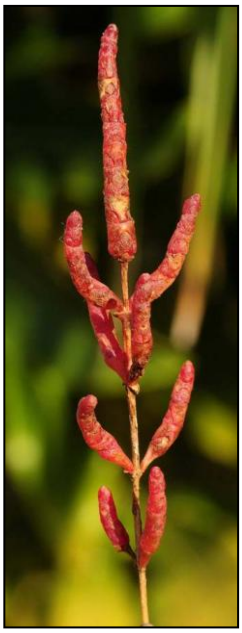
[693] Ball, P.W. & Tutin, T.G. (1959), Notes on annual species of *Salicornia* in Britain. *Watsonia* **4**: 193-205.

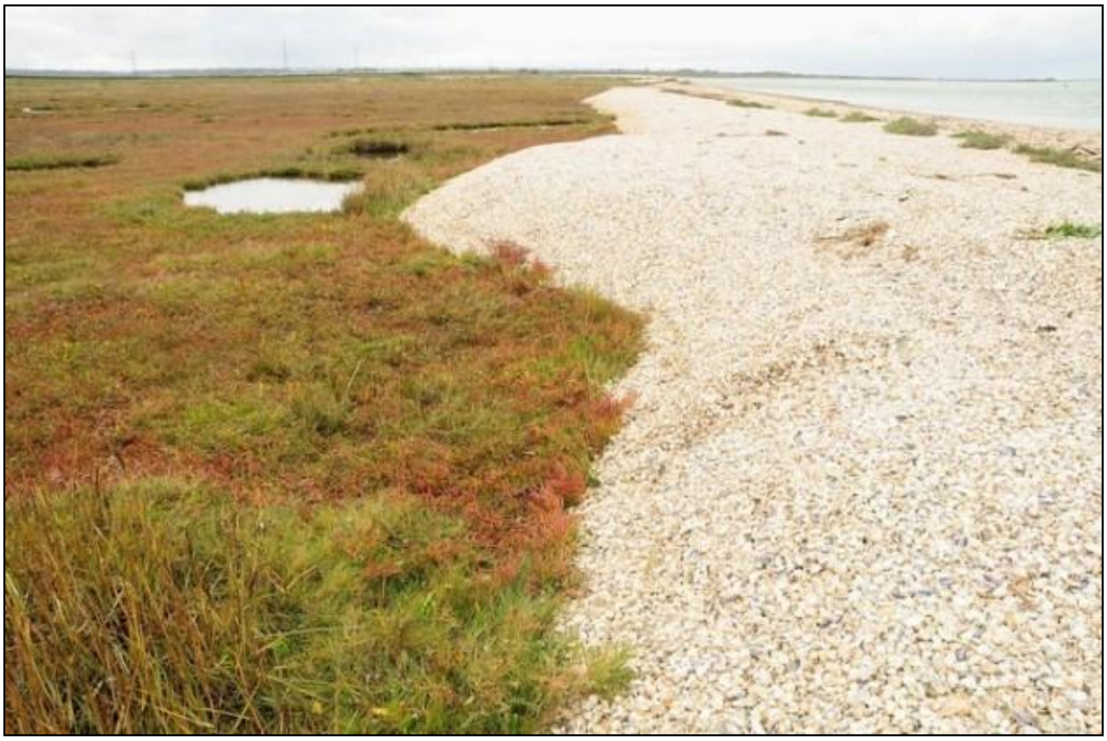
[694] The Glassworts crib sheet extract at the end of this account reflects the potential for longer than this by giving up to 90mm, although not recognised in Stace's *New Flora of the British Isles* (4th edition, 2019). Terminal spikes on Kent material have been found well exceeding 40mm, and show affinity with Continental material which can measure to 90mm.

While distinguishing this species is not straightforward, neither is its nomenclature. Our British taxon was first described by Ball & Tutin in 1959, as *Salicornia nitens*[695]. This remained in standard usage through the first and second editions of Stace's *New Flora of the British Isles*, although the latter (1997) stated that 'The French **S. emerici** Duval-Jouve might be the same and the name has priority'. *S. emerici* indeed became standard through the third and fourth editions, although Sell & Murrell (2018)[696] hold onto *S. nitens*, stating that 'we do not think it is the same as this French species'. Yet another view[697] suggests that *S. nitens* might be a microspecies of *S. emerici.* Lahondère (2004)[698] considered the names to be synonymous, and that *S. nitens* descriptions corresponded to specimens of *S. emerici* which had enjoyed insufficient lighting conditions (e.g. because at the northern end of their range) for the transformation of their initial green colour to the intense red that this species bears in the Mediterranean and western central France, perhaps to protect against higher ultraviolet levels. Whilst that intense red is supposedly not seen in Britain, it is evident (see accompanying illustration) that in Kent a definite reddening can occur and perhaps longer periods of hot weather are contributing to this.



Uplees Marshes, Oare. Photo by Lliam Rooney, 27 October 2020

Habitat, Castle Coote. Photo by Lliam Rooney, 23 October 2020



Equating our taxon with the French species enables us to compare ecological information. Lahondère mentions *S. emerici* as on the Atlantic shores requiring a substrate which remains damp, such as pools in old saltmarshes, whereas drier conditions favour *Salicornia ramosissima* (Purple Glasswort); also, germination is affected by strong salinity, to which *S. ramosissima* may be more tolerant. *S. emerici* may be the only glasswort present in open areas regularly flooded or where access to the sea is maintained; although in exceptional cases where such areas are transformed into cattle pasturage, the result may be a mosaic of *S. emerici* in the ground trodden down by the cattle and *S. ramosissima* on the raised humps between footprints. For Kent, it would be worth investigating the Fairfield area to see, not just if *S. emerici* has continued there after its 1962 sighting, but also how far similar mosaic conditions may obtain, although the effect of sheep pasturage is likely to be different.

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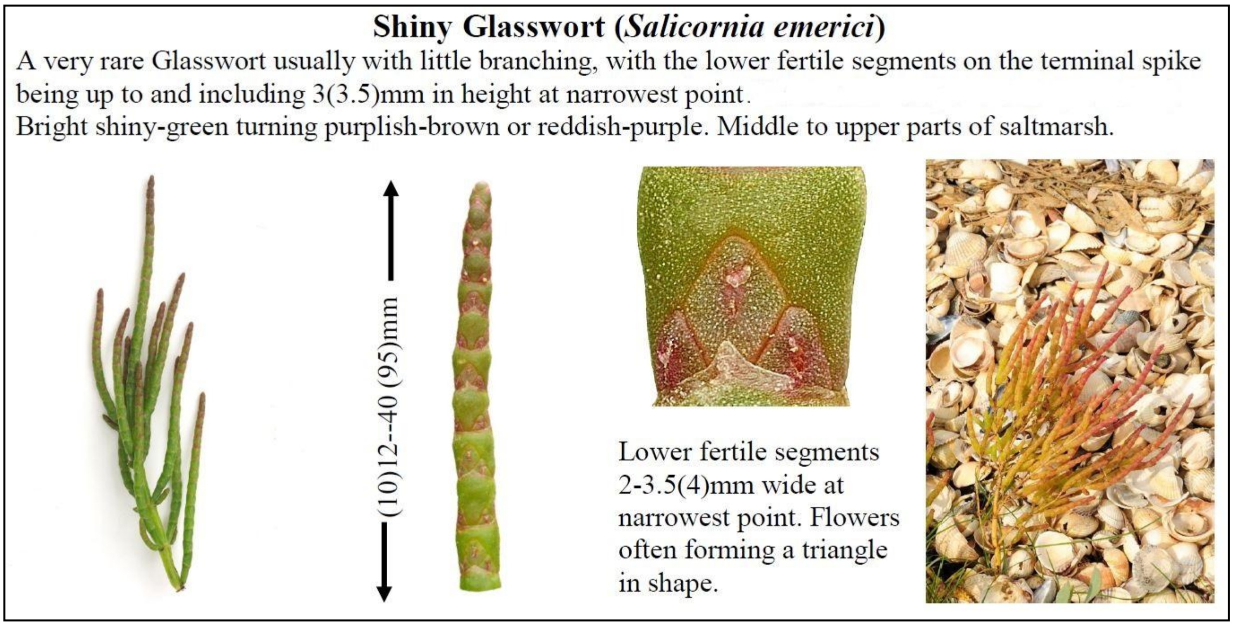
[695] Ball, P.W. & Tutin, T.G. (1959), Notes on annual species of *Salicornia* in Britain. *Watsonia* **4**: 193-205.

[696] Sell, P. & Murrell, G. (2018). *Flora of Great Britain and Ireland*, vol.1, Cambridge University Press, Cambridge

[697] Spanish studies cited in Kadereit et al. (2007), A taxonomic nightmare comes true: phylogeny and biogeography of Glassworts (*Salicornia* L., Chenopodiaceae). *Taxon* **56(4)**: 1143-1170.

[698] Lahondère, C. (2004). Les salicornes s.l. (*Salicornia* L., *Sarcocornia* A.J. Scott et *Arthrocnemum* Moq.) sur les côtes françaises. *Bulletin de la Société Botanique du Centre-Ouest* n.s. **24**, 122pp.



Shiny Glasswort (*Salicornia emerici*)

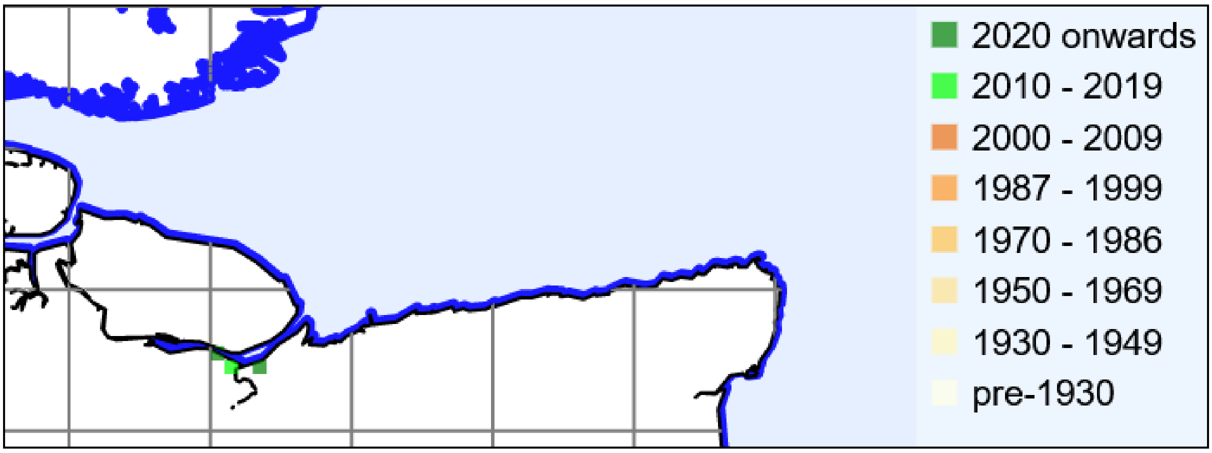
A very rare Glasswort usually with little branching, with the lower fertile segments on the terminal spike being up to and including 3(3.5)mm in height at narrowest point.

Bright shiny-green turning purplish-brown or reddish-purple. Middle to upper parts of saltmarsh.

Lower fertile segments 2-3.5(4)mm wide at narrowest point. Flowers often forming a triangle in shape.

From Glasswords crib sheet prepared by Lliam Rooney from Kentish specimens

Salicornia emerici Kent records to 2024 mapped at monad level, from BSBI database.



Salicornia fragilis P.W. Ball & Tutin (Yellow Glasswort)

vc 15 and 16

Rarity / scarcity status

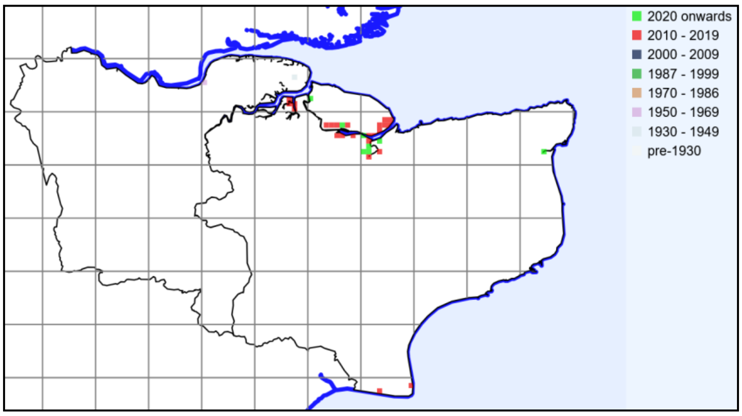
Salicornia fragilis is an annual of lower levels of saltmarshes scattered around the coasts of the British Isles although restricted in Scotland. It is a **nationally scarce** species and one whose conservation risk status is regarded as of 'Least Concern'. It is neither scarce nor rare in Kent. It is a Kent axiophyte and so is indicative of good habitat.

Oare, in *Spartina anglica*. Photo by Lliam Rooney, 5 October 2011

Account

Salicornia fragilis was first described in 1959, although there is apparently a specimen in **CGE** collected by E.S. Marshall on 17 September 1891 from Greatstone-on-sea, identified by P. Sell. It is quite possible that anyone seeing this species in Kent between 1912, when *Salicornia dolichostachya* (Long-spiked Glasswort) was described, and 1959, would have assumed that they were seeing *S. dolichostachya*, because of its similarity and this being the only suitable name available. The *Cambridge British Flora* (vol.2, 1914) mentions *S. dolichostachya* in Kent and there are records for 1945-54 from the Thames, Swale, Medway and Stour estuaries which may well have included *S. fragilis* among them. When the latter was named[699], its distribution was given as from E. Suffolk to Kent.

The BSBI database gives a few records for the period 1950-69, but these lack detail beyond the hectad in which recorded, so the first adequate assessment of its Kent status is given in Philp (1982). This gives *S. fragilis* as a plant of soft mud in the lower levels of saltmarshes, particularly on the sides of channels, and common in suitable habitats such as the Medway estuary (also extending to the Swale, and the Thames estuary as far east as Higham Marshes). The total of tetrad records was 29, which increased to 32 in the 1991-2005 survey published in Philp (2010). The change is probably not significant, except that the later records include the mouth of the River Stour, Sandwich. Our 2010-24 records are not substantially different, viz. 34 tetrads, (49 monads), even though there may be some under-recording on the Hoo peninsula and River Medway margins; a new location has been added at Dungeness.



***Salicornia fragilis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Salicornia fragilis grows in Kent on muddy saltmarshes, generally in the lower levels, below where *Puccinellia maritima* (Common Saltmarsh-grass) grows, but often in the lower reaches of *Atriplex portulacoides* (Sea-purslane) colonies, and sometimes (as at Conyer and Pegwell Bay) in the lowest zone with *Spartina anglica* (Common Cord-grass). It has been seen, but seldom, in the upper saltmarsh with *Salicornia ramosissima* (Purple Glasswort); but where it does extend above the lower or middle saltmarsh, it is most frequently by the edge of muddy channels, which tend to replicate the lower saltmarsh conditions somewhat, with earlier flooding and strong water movement. Zonation of species, with *S.* (cf.) *fragilis* occupying the lower parts was observed by Hambler (2011)[700] on the saltings of Chetney Canal (TQ 883 669), a tidal waterway excavated around 1810 in order to isolate Chetney Hill as a potential quarantine facility. The uncertainty of identification of *S. fragilis* probably reflects the date of his observations, 1951, i.e. before *S. fragilis* was formally described. He related the zonation to tidal 'sorting' of *Salicornia* seeds, so that the smaller seeds of the *S. europaea* aggregate (including *S. ramosissima*) would be deposited higher than the larger seeds of the *S. procumbens* aggregate (including *S.* (cf.) *fragilis*).

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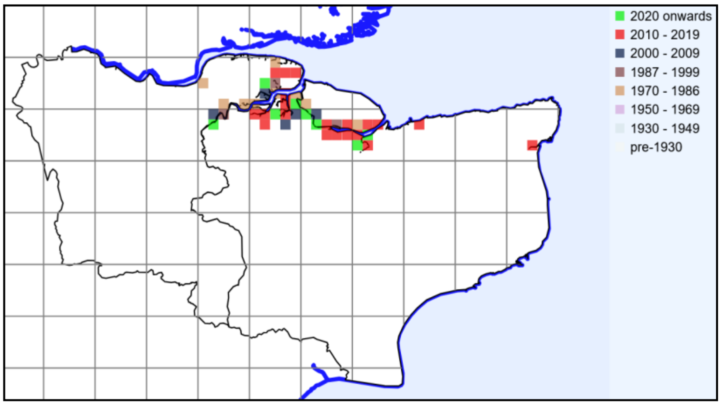
[699] Ball, P.W. & Tutin, T.G. (1959), Notes on annual species of *Salicornia* in Britain. *Watsonia* **4**: 193-205.

Oare. Photo by Lliam Rooney, 5 October 2011

The distribution of *S. fragilis* resembles that of *S. dolichostachya* (see accompanying map).

Salicornia dolichostachya **Kent records to 2023 mapped at tetrad level, from BSBI database.**



The latter is somewhat scarcer in Kent, so it may seem surprising that it is not a county rare plant register species, but this is a consequence of its wider distribution, as it is not nationally scarce, as is *S. fragilis*. The coincidence in distribution goes beyond appearing in the same monads (which is not altogether unexpected in view of the extent of availability of saltmarsh habitat), but the two species have often been found growing together in Kent. This may contrast with the situation in France, where *S. fragilis* is a species of somewhat higher levels than *S. dolichostachya*, and hence inundated for less time[701]. We have noted mixed colonies at many sites, and intermediate plants, which cannot readily be assigned to either taxon, at Conyer, Oare and Stoke Saltings. Hybridity between these species appears not yet to have been claimed, but there are widely varying views about the division of the *Salicornia* genus into species in any event and the characters to be attributed to species. Some of that variation may be covered by a taxon formerly called *Salicornia lutescens*, which is now generally treated as part of *S. fragilis*. Francis Rose regarded *S. fragilis* as probably only a modified habitat form of *S. dolichostachya*.[702] A study of morphological variation in tetraploid *Salicornia* in Norfolk, Essex and Sussex saltmarshes found evidence of a variant corresponding to *S. fragilis*, even though the authors preferred to consider it as part of *S. dolichostachya* agg.[703]

S. fragilis may be identified as part of the *S. procumbens* aggregate of tetraploid glassworts by the three flowers (cymes) being more or less equal in size; and by the fertile segments being cylindric, not markedly swollen or 'waisted' like a set of beads. The aggregate includes *S. emerici,* whose distinguishing characters are

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[700] Hambler, D.J. (2011). *Salicornia* 'sorts' (2): zonation, dispersal, seeds and sorting. *BSBI News* **118**: 35-40.

[701] Lahondère, C. (2004). Les salicornes s.l. (*Salicornia* L., *Sarcocornia* A.J. Scott et *Arthrocnemum* Moq.) sur les côtes françaises. *Bulletin de la Société Botanique du Centre-Ouest* n.s. **24**, 122pp.

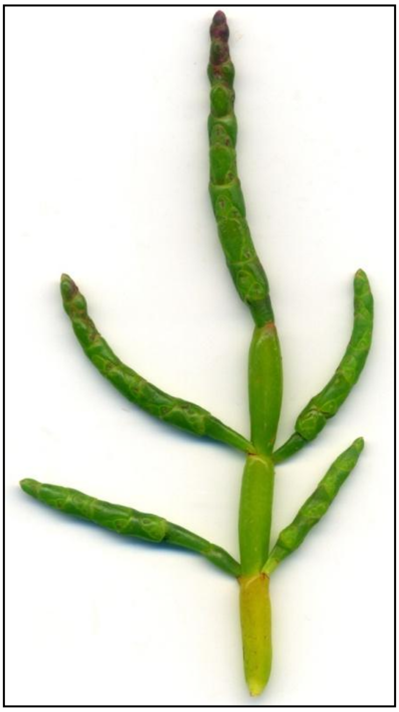
[702] It is not treated separately in his manuscript *Flora of Kent*, which was laid out with somewhat outdated glasswort names, but this view is stated in Brewis, A., Bowman, P. & Rose, F. (1996), *The Flora of Hampshire*; and *S. fragilis* is given as a var. of *S. dolichostachya* in his Key to annual *Salicornia* species of South England and North France, *BSBI News* (1989) **53**: 12-16.

[703] Ingrouille, M.J., Pearson, J., Havill, D.C. (1990). The pattern of morphological variation in the *Salicornia dolichostachya* Moss group from different sites in southern England. *Acta Botanica Neerlandica* **39:** 263–273.

given in its own rare plant register account. The other British species in the aggregate are *S. fragilis* and *S. dolichostachya*, which are separated by the terminal spike being more or less cylindrical in *S. fragilis* and usually tapering in *S. dolichostachya* (but 'more or less' and 'usually' imply potential for overlap); by the terminal spike bearing 6-15(22) fertile segments in *S. fragilis* and 12-30 in *S. dolichostachya* (so there is overlap in the range of 12-15(22) segments; and by the colour, with *S. fragilis* becoming yellowish-green to bright yellow, and *S. dolichostachya* becoming dull green, dull yellow or yellowish-brown (these are the colours given in Stace's *New Flora of the British Isles* and are not necessarily easy to interpret where colour is in the course of changing on the plant; and in any event, both generally go yellow before browning, albeit *S. fragilis* does so sooner as it appears to be an earlier flowerer).

Habitat, Stoke Saltings. Photo by Lliam Rooney, 9 October 2012

Setting aside the degree of rapprochement between *S. fragilis* and *S. dolichostachya*, it is possible that *S. fragilis* may hybridise with other species, but there is general reluctance to seek that explanation for anomalous plants in view of the general taxonomic difficulties with *Salicornia*.



Salicornia sp., Oare. Photo by Lliam Rooney, 18 October 2019

An example of a problem plant is illustrated here, a glasswort found by Lliam Rooney at Oare where both *S. fragilis* and *S. ramosissima* (Purple Glasswort) were growing together. The majority of the fertile segments look to be tetraploid (as is *S. fragilis*) with their straight sides and equal flowers (cymes) within each triad. However, the upper segments of the left branch and terminal spike have greater affinities with diploid species (such as *S. ramosissima*) in that their outline is swollen or beaded and the flower triads have the central flower distinctly larger than the lateral ones. The purple colouration associated with *S. ramosissima* (reflecting the production of betacyanin as a result of environmental stress) also affects those segments; an occasional speck of red or pink tinge in some plants from the *S. procumbens* aggregate also being noted by Hambler (2012)[704]. Lliam Rooney comments that *S. ramosissima* can have lower segments tending to a tetraploid appearance, and it may part of normal growth development, but with the generally smooth cylindrical spikes here, this example is well outside usual experience. However, the possibility of hybridization between the two species is not something which may be readily resolved on morphological evidence alone.

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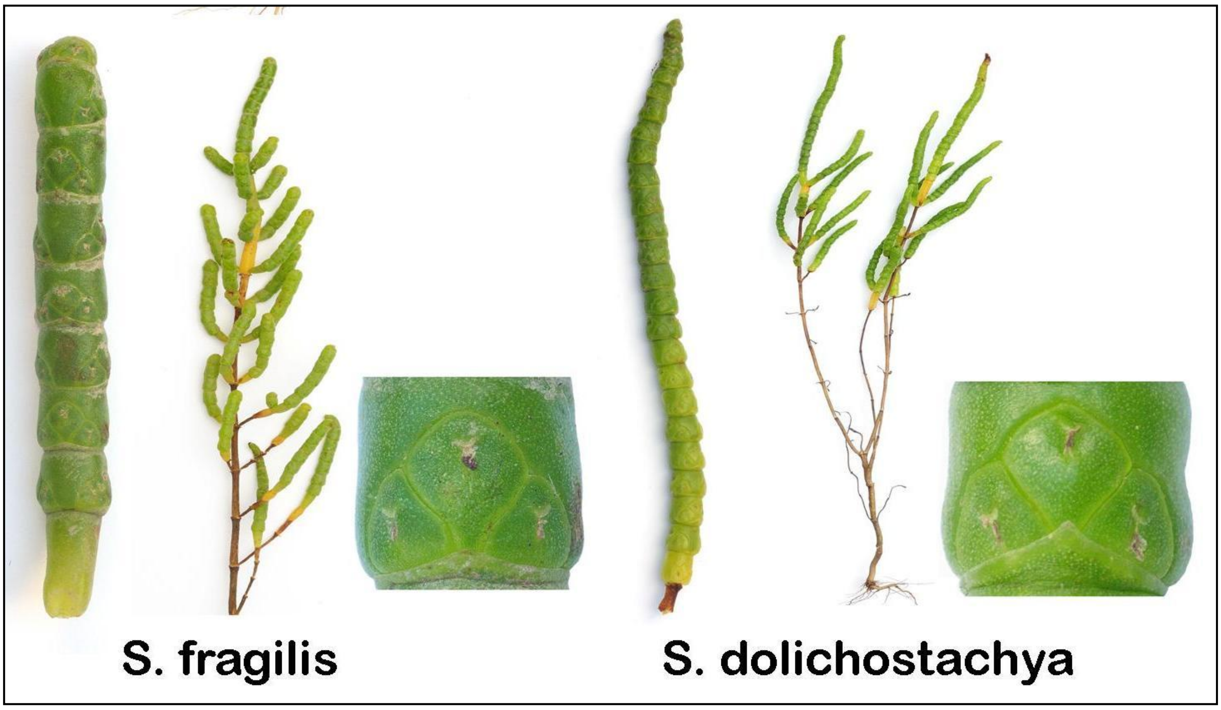
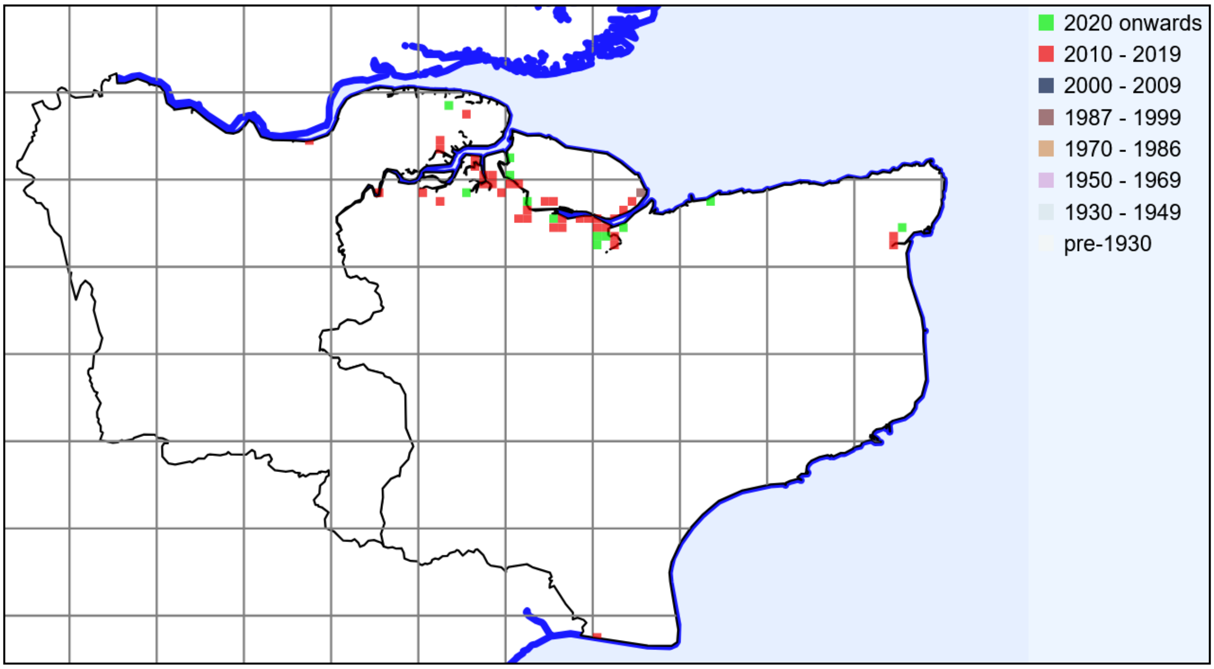
[704] Hambler, D.J. (2012). *Salicornia*: photographs – a visual aid. *BSBI News* **120**: 28-30.


S. fragilis
S. dolichostachya

From *Salicornia* crib sheet prepared by Lliam Rooney from Kentish specimens

Salicornia fragilis **Kent records to 2024 mapped at monad level, from BSBI database.**

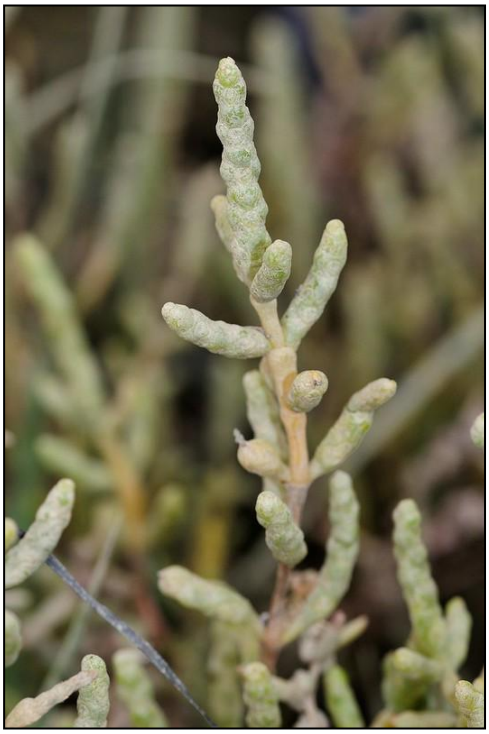

2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Salicornia obscura P.W. Ball & Tutin (Glaucous Glasswort)

vc 15, presumed lost from vc16

Rarity / scarcity status

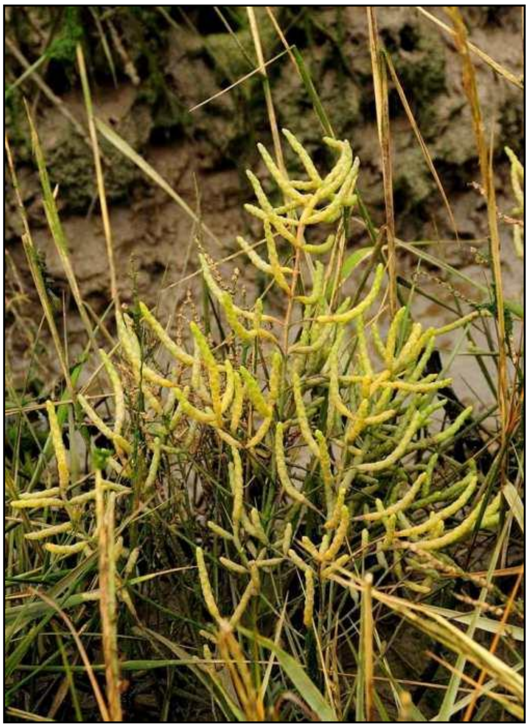
Salicornia obscura is an annual of saltmarshes, very sparsely scattered round the coasts of the British Isles, but mostly in South Essex, and **nationally rare**. It has not been assigned a threat category for conservation purposes as not enough is known about it. In Kent it has seldom been seen, and is **rare**.



Oare. Photo by Lliam Rooney, 5 October 2011

Account

Salicornia obscura was first described in 1959. Its first published Kent record (in the sense of publication date) is in Philp (2010): 'Plants fitting the description of this species were recorded from the middle part of the salt-marshes along the Swale at Elmley TQ96N and Oare Marshes TR06C'. The find dates are not given, but for Elmley it was 4 October 1994. The cautiousness of the identification is not unfair, given its difficulty. The finds were predated by a 1951 sighting by David Hambler published in 2013[705], identified retrospectively from a photograph. This was of a small stand of plants growing on a barge hulk in Whitewall Creek (TQ7569) by the Chatham Reach of the River Medway (since reclaimed and now under Neptune Close, vc16). They had the characteristic bulging fertile segments, lack of secondary branching and upward curvature of the lowest primary branches; another possible stand was noted three or four km upstream, outside the wall fringing Temple Marsh.



Conyer. Photo by Lliam Rooney, 26 November 2019

The species was seen again at Oare in October 2011, when Eric Philp led a Kent Botanical Recording Group meeting to review the glassworts there, and it was recorded in the upper saltmarsh from TR 017 644, as occasional through to TR 016 643. A revisit by the KBRG in October 2019 failed to re-find *S. obscura*, but later that month Lliam Rooney found a small colony at the extreme lower end of the saltmarsh at Conyer Creek, TQ 96165 65554. As late as 26 November, even after frosts, he and Danny Chesterman found another small colony further west at Conyer, TQ 95837 65226 and a couple of plant about ten metres further west still. They were the only undecayed glassworts at that time of year, and had developed a dull yellow-green colour. They were well down the saltmarsh, in *Spartina anglica* (Common Cord-grass), by a muddy channel.

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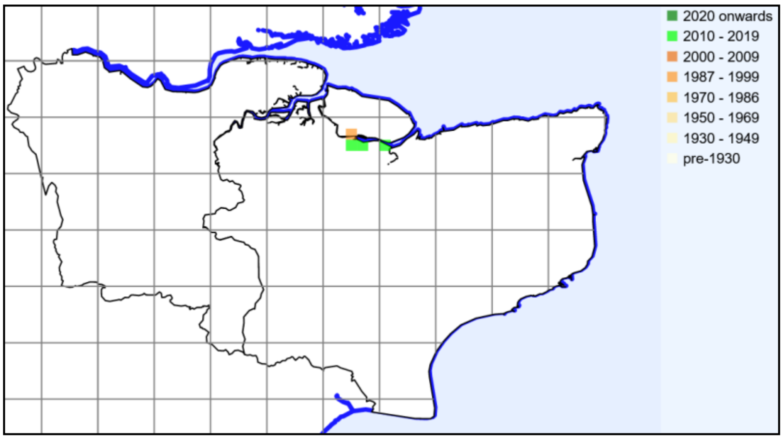
[705] Hambler, D.J. (2013). The obscure Glaucous Glasswort; *Salicornia obscura*. *BSBI News* **124**: 5-6.

It is generally considered to be a plant of bare mud, salt pans and the sides of channels in saltmarshes (Ball & Tutin).[706] Francis Rose noted it as a plant which grows on mud or sandy soil in open communities in lower parts of saltmarshes, below the *Puccinellia maritima* zone[707], but this may not be the result of any Kentish observations, as the species does not feature in his manuscript *Flora of Kent*, and there may be some contradiction with the *Flora of Hampshire* (1996) which he co-authored and in which the species is said to prefer the sloping sides of upper saltmash creeks.

Conyer, habitat. Photo by Lliam Rooney, 26 November 2019

It belongs among the diploid species of *Salicornia,* as may be seen by fertile segments being swollen and 'waisted' like a set of beads; also, the flowers (cymes) in their groups of three are markedly unequal, especially in the mid-part of the terminal spike. The other British diploid species are *Salicornia europaea* (Common Glasswort) and *Salicornia ramosissima* (Purple Glasswort). The latter differs from *S. obscura* in having fertile segments which are more strongly beaded; by having a clear shiny surface which changes colour from green to reddish-purple or red; and by the angle made within the apex of the fertile segments being 110°-120°. *Salicornia europaea* is perhaps closest in appearance to *S. obscura*, and differs from it in being clear green, neither glaucous nor matt, becoming reddish or yellowish-orange with age; and by the angle made within the apex of the fertile segments being 90° or less, as a result of that apex forming a distinct cusp. It is possible that *S. obscura* should be regarded as a variant of *S. europaea*.

S. obscura itself may be characterised as having a glaucous green, matt surface, never reddening, other than sometimes to a minor degree around the flowers, but yellowing in late development; having branches which curve upwards at the end, with little, if any, secondary branching and no tertiary branching; having relatively short lower branches (i.e. usually less than half the length of the main stem, so giving a pyramidal appearance to the whole plant); and with the angle made within the apex of the fertile segments being 140°-150°.



Salicornia obscura **Kent records to 2024 mapped at tetrad level, from BSBI database.**

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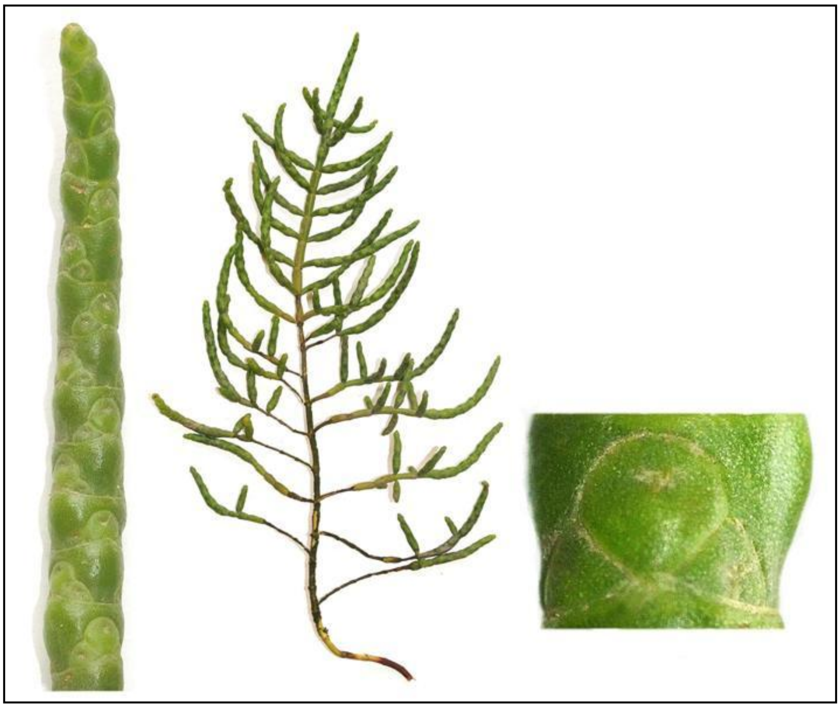
[706] Ball, P.W. & Tutin, T.G. (1959), Notes on annual species of *Salicornia* in Britain. *Watsonia* **4**: 193-205.

[707] Rose, F. (1989). Key to annual *Salicornia* species of South England and North France (modified from a key by Prof. Géhu (1979) by Dr. F. Rose with some additional material), *BSBI News* **53**: 12-16.

Although the triad flowers are unequal (as with the diploid species generally), those of *S. obscura* are perhaps more equal than those of *S. ramosissima* and *S. europaea*, the lateral flowers may give the impression of being more emergent from the segment below, with the perianth higher above the underlying scarious border than is the case with the other species – in consequence, the lateral flowers sometimes meet, below the central flower. The scarious border at the apex of the border of the fertile segments is broadest with *S. ramosissima* (0.1-0.2mm), then *S. europaea* (c.0.1mm) and narrowest is *S. obscura* (c.0.5mm, although Lahondère (2004)[708] refers to measurements up to 0.15mm); however, the distinction between the scarious margin and the general border tissue is not always clear.



From *Salicornia* crib sheet prepared by Lliam Rooney from Kentish specimens

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[708] Lahondère, C. (2004). Les salicornes s.l. (*Salicornia* L., *Sarcocornia* A.J. Scott et *Arthrocnemum* Moq.) sur les côtes françaises. *Bulletin de la Société Botanique du Centre-Ouest* n.s. **24**, 122pp.

Salix purpurea L. (Purple Willow)

vc 15 and 16

Rarity / scarcity status

Purple Willow grows scattered throughout the British Isles, frequently planted although it is not always practicable to distinguish between native and introduced occurrences. Its conservation risk status is of 'Least Concern'. There are some parts of the British Isles where it is much less frequent, and these include Kent/Sussex. On the basis of the data in Philp(2010) it would be treated as **scarce** in the county. From our subsequent records it would seem to be **near scarce**, so its inclusion in this register is marginal.

Stodmarsh. Photo by Lliam Rooney, 25 March 2014

Account

The first Kentish record is given by Hanbury & Marshall (1899) as by Joseph Woods junior in relation to what was called *Salix Lambertiana* (a broad-leaved form), 'About Ham Ponds near Sandwich', published in Turner and Dillwyn's *The Botanist's Guide through England and Wales (*1805). Hanbury and Marshall assessed 'Bitter Purple Willow' as a rather scarce native of streamsides, marshes and wet thickets, giving records across the county. These included water-meadows at Northfleet; by the river above Darenth; Davington Osiers (this suggests cultivation, perhaps to supply charcoal for the gunpowder works, although it is a basket-making willow); in the marshes at Sarre, Minster and Monkton; fields, thickets and rough swampy ground at Snodland; and by the Eden near Chiddingstone.

Fairfield. Photo by Lliam Rooney, 4 August 2013

Francis Rose considered it probably native and very rare in Kent. To the older records he was only able to add presence in a hedgebank at Stone Street, Seal (1949), a roadside spinney at Five Wents, Eastry (1960) and near Fordwich Church (undated). Twelve tetrads, however, were noted in Philp (1982), by ponds and streams and in marshes across the county, but with a concentration in TR02, including around St Mary in the Marsh, Old Romney and Ivychurch. TR02C, west of Old Romney, also featured in Philp (2010) together with another Romney Marsh record at Fairfield, but these with Nettlestead Green and Harrietsham were the only sites found in the 1991-2005 survey. Despite the records total having reduced by two-thirds between surveys, this is not indicative of a real decline, as our 2010-24 records amount to 13 tetrads (13 monads) However, one of these is obviously an urban ecology park planting); plants near Conningbrook Lakes, Ashford shown on the map may well be planted; and trees by the Stour at Stodmarsh are described by Alex Lockton[709] as appearing to be an old withybed. Indeed, there is uncertainty about the status of many of our recorded trees and bushes.

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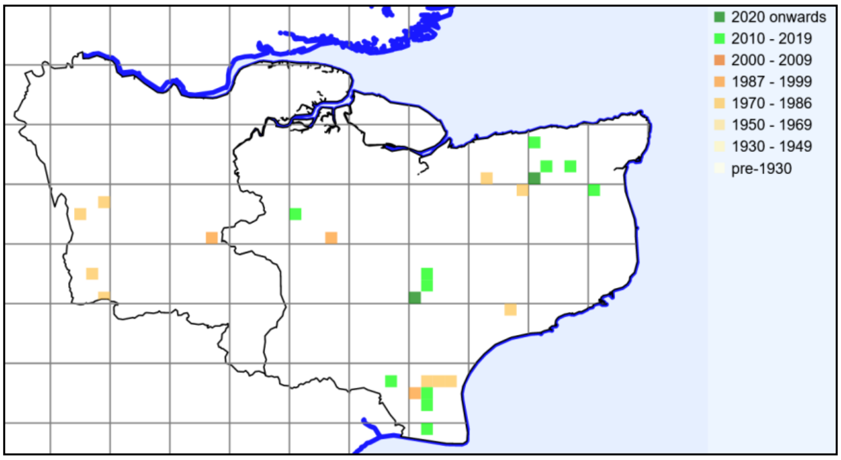
[709] *The Flora of Stodmarsh National Nature Reserve* (2017).



Salix purpurea **Kent records to 2024 mapped at tetrad level, from BSBI database.**

Plants have continued to be seen in the Old Romney and Fairfield areas, and it is interesting that recent records have picked up presence at Stodmarsh, Pluck's Gutter and the Ash Levels relating to the Stour catchment, since these may reflect some continuity with historic Sarre, Monkton and Minster Marshes occurrences. This raises the question as to whether *Salix purpurea* here has any connection (other than the general association of willows with water) with the fact that both these areas represent reclaimed marshland, the Stour originally having a wider channel which, with the Wantsum provided a marine inlet surrounding the Isle of Thanet, and the River Rother before 1287 having taken a course through tidal flats via Old Romney.

Our recent records have tended to be the odd one or two small trees or bushes growing alongside a river, stream or roadside ditch. There are no sustained populations (other than the presumed old withybed mentioned above) and the most extensive recorded occurrence has been along 10m of roadside near Fairfield, with a neighbouring outlier. Where we have noted associated species, these have tended to be other willows, e.g. *Salix viminalis* (Osier), but may be expected to be species of damp habitats, such as *Carex acutiformis* (Lesser Pond-sedge) and *Petasites hybridus* (Butterbur) at Bearsted. The absence of recent records for West Kent is a little surprising, and it may be worth checking not-so-recent records such as at Leybourne Lakes (TQ 7063 6004 in 2006) and Bedgebury Park School (TQ 724 344 in 1999).

Salix purpurea scarcely reaches the stature of a tree and generally does not have a distinct trunk. The leaves are characteristic, being usually opposite, sub-entire, bluish-green with a pale central vein: they look more blunt and rounded towards their apical point than most other willows. The flowers appear before the leaves, the male ones with reddish-purple anthers. The two filaments are joined so that each flower appears to have only one stamen, and this is the only one of our willows which does this.

Stodmarsh. Photo by Lliam Rooney, 18 August 2018

It hybridizes with various other species and we have records from various sources given in Hanbury & Marshall (1899) of *Salix purpurea* x *viminalis* and (queried) *Salix purpurea* x *triandra*; but none more recent.

Salix repens L. (Creeping Willow)

vc 15 and (but not recently) 16

Rarity / scarcity status

Salix repens is found throughout the British Isles, other than much of the Midlands on acid heaths and moors, fens and dunes. It is treated as **Near Threatened** in England as a comparison over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 20% reduction in the likelihood of recording the species. In Kent, there is limited suitable habitat and it is **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first mention of Creeping Willow in Kent is by Parkinson in his *Theatrum Botanicum* (1640)[710], at Romney Marsh, presumably near New Romney where there is a nineteenth century record by J.G. Baker which may reflect an earlier stage of development of duneland around the Warren.

Covert Wood. Photo by Alfred Gay, May 2011

Subsequent early records are mostly focused in the two areas. The first is the acid commons of north west Kent (West Wickham, Keston, Hayes, St Mary Cray and Chislehurst), from which *Salix repens* has since disappeared, probably largely due to the development of secondary woodland, the last records being 1966 (Rodney Burton, by a pond at the north edge of Chislehurst Common) and 1951 (Keston Bog[711]). The second is the duneland and fens of East Kent: from Sandwich, where noted by John Ray in 1690[712] to the Deal sandhills (1777), about Walmer Castle (1804)and Ham Ponds (1839), with outliers at New Romney and Dungeness, although this last site will have been on consolidated shingle rather than sand-dunes[713].

The Sandwich Bay dunes have provided continuity from 1690 to the present between Sandwich and Deal. Francis Rose described Creeping Willow as locally abundant there in 1958 and recently (2011-24) it has been noted in dune-slacks on both Royal St George's and Royal Cinque Ports golf courses, as well as a bird scrape margin on Bird Observatory Land. Inland, the former site of Ham Ponds, now Ham Fen, had continuity from William Pamplin's observations published in 1839 In Matthew Cowell's *A Floral Guide for East Kent* through to Francis Rose finding it from very abundant to locally dominant in the period 1946-52, forming open scrub 1–4 feet high and growing with *Cladium mariscus* (Great Fen-sedge) and *Thelypteris palustris* (Marsh Fern). In his manuscript *Flora of Kent*, he noted that it could not be found after the site became temporarily flooded with seawater in January 1953, but his notebooks show that he re-found it in 1991. Of the other coastal sites, occasional records have continued in the New Romney area but there have been many at Dungeness, not just by the Open Pits, but also more widely there, in seven different monads 2010-24 at times frequent and apparently spreading.

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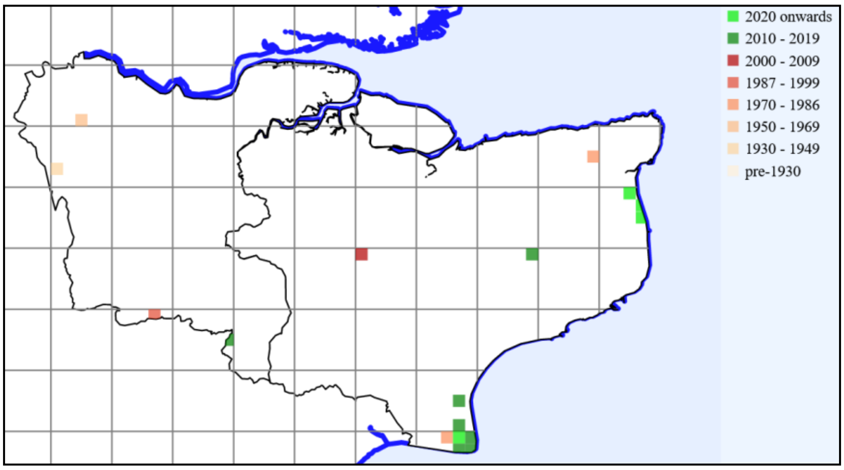
[710] He dealt with a number of plants under the heading '*Salix pumila latifolia*. The low broad leafed Willow' which appear to include *Salix repens*, and their sites (although not assigned to any one of these named Willows) include '*Rumney* Marshes'. Separately he dealt with '*Salix pumila angustifolia*. Low narrow leafed Willowes', also appearing to include *Salix repens*, but without sites. Presumably this disparate treatment reflects the wide level of variation of what has now long been one species.

[711] John, J. & Price, J. (20`4). Heathland restoration at Keston and Hayes Commons: Part of Darwin's landscape: past and present. *Transactions of the Kent Field Club* **19**: 75-99.

[712] *Synopsis Methodica Stirpium Britannicarum* (1690): 'in arenosis prope Sandvicum Cantii maritimum oppidum' (in sand-dunes near the Kentish coastal town of Sandwich).

[713] Given by George Dowker at p34 of the *Report of the East Kent Natural History Society* (Session 1867) as at a pond, Dungeness, presumably the Open Pits, although he was not wholly sure whether it was *Salix repens* or *Myrica gale*.

Apart from the north west Kent commons and the east and south east coastal sites there have been some scattered inland sites. Eric Philp's Tunbridge Wells Common record of 1991-98 may be the same location as Clive Stace's record by Brighton Lake, Eridge Road at the southern end of the common. It was also known at Southborough Common before 1899 but seems likely to have disappeared by 1918. In 2016 a young plant was found growing in cleared woodland on the Scotney estate near where a small pond or scrape had been opened up; (not recorded since) and there is also a Bedgebury pinetum sighting by Francis Rose 1946-57, originally found by A.B. Jackson (died 1947). All these records are on the acid Tunbridge Wells Sand Formation which also includes clay elements which can impede drainage locally and which may be a factor in some of these records.



***Salix repens* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The historic distribution is illustrated here, so far as relevant records are contained in the BSBI database.

An early eighteenth century specimen from Southfleet[714] was considered by Francis Rose to relate to ancient valley fen between Northfleet and Southfleet, since terribly polluted. It is, however, echoed by the presence of *Salix repens* in very calcareous conditions of the Eastern Quarry at Swanscombe, found by a Kent Field Club meeting in September 1998 (the area is in course of redevelopment). Another isolated site is a community field facility near Stonebridge Green in the Great Stour catchment, a degenerated water meadow on the Hythe Formation where Creeping Willow was found by Eric Philp and Brian Woodhams in 2005. A further site not falling into any obvious pattern is Covert Wood, a remarkable location in which the underlying chalk appears to have been modified by head deposits so that an acid flora, with plants such as *Polygala serpyllifolia* (Heath Milkwort) and *Calluna vulgaris* (Heather) has developed. This was most recently investigated in May 2011 Alfred Gay discovered a single patch of *Salix repens* growing in a slight ditch beside one of the main paths, but it is not a one-off, as Joyce Pitt has been aware of two locations here, earlier on.

Sandwich, var. *argentea*. Photo by Sue Buckingham, 29 October 2011

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[714] Stated in Hanbury & Marshall (1899) to be in the herbarium of Dillenius, but *The Dillenian Herbaria. An account of the Dillenian collections in the Herbarium of the University of Oxford* (1907) gives Southstreet rather than Southfleet, so a mistranscription appears to be involved.

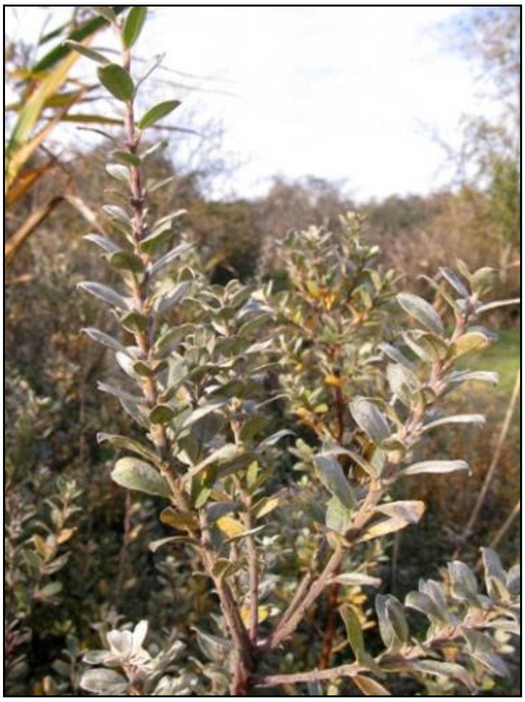
This woodland context is very surprising for *Salix repens*, which is normally a plant of open ground and has an Ellenberg light value of 8, applicable to light-loving plants rarely found where relative illumination in summer is less than 40%.

Salix repens is distinctive by virtue of its low creeping habit (but not as ground-hugging as the alpine willows), never developing as a tree or substantial shrub, but generally less than 1m high. The leaves do not exceed 3.5 x 2.5cm and are generally hairy at least on the underside. It is an extremely variable species and currently separated into three varieties, although they may intergrade.

The most conspicuous is var. *argentea* (formerly treated as a separate species, *Salix arenaria*), with ascending silky-hairy stems and with silvery larger leaves densely hairy on both sides. We have recorded this in 2011-22 frequently at Dungeness (as far north as Littlestone) and Sandwich Bay which is appropriate, as this is usually a plant of dune slacks.

The commonest variant in the British Isles (but not Kent) is var. *repens*, a plant of heaths and moors, which has procumbent stems, soon becoming near-glabrous, with small, sparsely hairy leaves. We have only recorded this at Tunbridge Wells Common and Scotney, but it is likely that this is the identity of nearly all our inland records (but not the Swanscombe plant, which was var. *argentea*). Francis Rose named this from plants he saw at Keston and Chislehurst Commons and Bedgebury.

A third variant, var. *fusca*, has somewhat erect hairy stems and the leaves are similar to those of var. *repens*. It is a plant of East Anglian fens, but the Stonebridge Green record was assigned to this variety, the only one for Kent; drainage through the sandstone and interbedded limestone of the Hythe Formation here may be capable of producing local fen-like conditions.



Sandwich, var. *argentea.* Photo by Sue Buckingham, 29 October 2011

Despite the north west Kent losses, it is supposed to be a resilient species, capable of coping with both dry and very wet conditions (although not so much as regards dry conditions in south and east England). It is found on infertile soils; obviously the Dungeness consolidated sand/shingle fits this, but also the sand dunes and acid inland Kent sites. There may be some limitations on areas of occurrence due to its mycorrhizal associations, which are with both arbuscular mycorrhiza and ectomycorrhiza. These have been much studied in recent years, and the diversity of mycorrhiza involved may assist the plant in coping with a range of environmental conditions. *Salix repens* is also considered to be resilient to increased temperatures and carbon dioxide of climate change, in spite of being slow-growing[715].

Salix aurita x *repens* (*S.* x *ambigua*) has been reported by the Rev. H.A. Stowell in 'Faversham Plants' (*The Phytologist* (1857) **2**: 155) as 'By a stream in Hernhill Wood', which Hanbury and Marshall (1899) thought very doubtful (and so it is). Dillenius' herbarium includes a specimen (determined by Dr. Druce) from Mr. Littleton

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[715] Nissinen, K. et al. (2016). Slow-growing *Salix repens* (Salicaceae) benefits from changing climate. *Environmental and Experimental Botany* **128**: 59-68.

Brown '*By ye foot way on ye first enclosure going from Tunbridge Wells to ye Cold Bath shrubby 6 foot high*'[716]; the Cold Bath (built 1708, discontinued by 1780) was at what is now Beacon Hotel, Tea Garden Lane, and the general area would be consistent with existence then of the *Salix repens* parent.

Salix cinerea x *repens* (*S.* x *subsericea*) was noted by Francis Rose, 1948-54, at Ham Ponds, var. *argentea* of *Salix repens* being involved. The cross was also recorded by David Holyoak on 10 October 2006 at Dungeness, TR 066 197 by the ARC pits; *Salix repens* is abundant here, and *Salix cinerea* is the most likely willow to accompany it generally in Kent.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Tunbridge Wells Common	TQ53U	Managed by Tunbridge Wells Commons Conservators	1991-98	EGP	Var. *repens*. May have been near Brighton Lake, where, on a nearby bank, shown by CAS to a KFC meeting on 9 June 1962.
Eastern Quarry Swanscombe	One or other of TQ5974, TQ5973 or TQ5873		6 September 1998	KFC meeting	Var *argentea*. Former chalk quarry with wet floor.
Scotney estate	TQ6934	National Trust	15 May 2016	KBRG meeting	Var. *repens*. Very young plant, recently cleared area in woodland, c. TQ 6917 3466
Stonebridge Green, Lenham	TQ9148		13 July 2005	EGP, BW	Var. *fusca*. Degenerate water meadow, just beyond field boundary fence.
Dungeness, Denge Marsh	TR01P		After 1970, before 1981	Philp (1982)	Var.*argentea*. TR01P
Dungeness (Muddymore, Pen Bars)	TR0617	SSSI	10 August 2013	TI	Var. *argentea*.
Dungeness (Boulderwall, , Denge Beach)	TR01U (includes TR0618, TR0619, TR0719)	SSSI, RSPB reserve	(1) 30 April 2022 (2) 1 August 2019 (3) 22 May 2019 (4) 10 July 2016 (5) 24 September 2013 (6) 5 August 2012 (7) 20 August 2011 (8) 19 July 2010 (9) 15 June 2010 (10) 3 June 2010 (11) 10 October 2006 (12) 30 October 2004 (13) 22 October 2002 (14) 5 September 2002 (15) 26 June 1996	(1) SL (2) AW (3) AW (4) KBRG meeting (5) CO (6) BW (7) SB (8) JA (9) GK (10) DG (11) DTH (12) DTH (13) DTH (14) MG (15) EGP	(1) Dungeness SSSI (Unit 27), Walkers Outland, sandy shingle along public footpath behind New Diggings, TR 0681 1906. In seed. (2) TR0618 & TR0719. (3) TR0618. (4) Var. *argentea*, TR0618. (5) Frequent, opposite Boulderwall farmhouse. (6) TR0618. (7) Var. *argentea*. TR0619. (8) one plant at TR 06758 18459 and prolific at TR 06753 18118. (9) TR 016 583, *Cladium* pit. (10) Dungeness RSPB Reserve (ARC side), TR 0743 1917, large patch. (11) TR 066 197. (12) TR 065 198. (13) TR 066 198. (14) TR0719, ARC pit. (15) Var. *argentea*, TR01U.
Dungeness	TR01Y (includes TR0817)	SSSI	(1) 26 June 2022 (2) 3 July 2011 (3) 27 June 1996 (4) After 1970, before 1981	(1) KBRG/WFS meeting (2) TI (3) EGP (4) Philp (1982)	(1) Var. *argentea*, TR0817. (2) Var. *argentea*, TR0817. (3) Var. *argentea*, TR01Y. (4) Var. *argentea*, TR01Y.
Dungeness, Long Pits	TR01Z (including TR0818)		(1) 23 August 2013 (2) 30 July 2011(2) (3) 27 June 1996 (4) After 1970, before 1981	(1) CO (2) TI (3) EGP (4) Philp (1982)	(1) TR0818. (2) Var. *argentea,* TR0818 (3) Var. *argentea,* TR01Z. (4) Var. *argentea,* TR01Z.
Lydd-on-Sea	TR02Q (including		(1) 15 June 2013	(1) TI	(1) Var. *argentea*. TR0620

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[716] G.C. Druce, ed. S.H. Vines (1907). *The Dillenian Herbaria. An account of the Dillenian collections in the Herbarium of the University of Oxford.*

	TR0620)		(2) 1991-99	(2) EGP	(2) Var. *argentea*. TR02Q
New Romney/ west Littlestone	TR0724		3 October 2013	OL	Var. *argentea*.
Covert Wood	TR1848	Access land	(1) May 2011 (2) 18 June 2004	(1) AG (2) JP	(1) Covert Wood, a single clump growing in a slight ditch beside one of the main paths at TR 184 485 with species such as *Polygala serpyllifolia*, *Calluna vulgaris*, *Teucrium scorodonia* and *Ajuga reptans.* (2) TR 181 484, plateau area, distinct from where found some four years before.
Monkton	TR26X		After 1970, before 1981	Philp (1982)	
Ham Fen	TR3454		24 July 1991	FR	
Sandwich Bay	TR3458	SSSI	19 May 2020	SB	TR 3556 5828, St Georges golf course, old dune slack.
Sandwich Bay	TR3557	TR 353 578	2 March 1983	ACH	TR 353 578.
Sandwich Bay	TR35P (includes TR3558, TR3559)	SSSI, at least in part	(1) 21 May 2013 (2) 4 August 1996 (3) After 1970, before 1981	(1) CO (2) FR (3) Philp (1982)	(1) TR3558, one patch by footpath across golf links. (2) TR3559, dune slack. (3) Var. *argentea*, TR35P
Sandwich Bay (Deal Sandhills)	TR35S (includes TR3754, TR3755)	SSSI	(1) 30 April 2022 (2) 1 November2021 (3) 17 July 2020 (4) 6 May 2013 (5) 1991-99 (6)After 1970, before 1981	(1) CO (2) SB (3) SB (4) SB (5) EGP (6) Philp (1982)	(1) TR3754. (2) two plants on the margin of a pool in sand at TR 37430 54435 (3)TR3755. (4) Var.*argentea.* Frequent on the dunes on Royal Cinque Ports golf course, TR3755. (5) & (6) *Var. argentea,* TR35S.
Sandwich Bay	TR35T (Includes TR3656, TR3657)		(1) 23 May 2022 (2) 6 August 2020 (3) 1 August 2011 (4) 1991-99 (5) 2 March 1983 (6)After 1970, before 1981	(1) KBRG meeting (2) SB (3) SB (4) EGP (5) ACH (6) Philp (1982)	(1) In the area known as The Gullies, the remnants of a canal dating back to 1550s. Var. *argentea.* (2) TR3657, var. *argentea*, new enlarged bird-scrape. (3) (a) Var. *argentea*, TR3656. (b) Var. *argentea*. Five plants TR 36094 57043 margin of bird scrape, managed by Sandwich Bay Bird Observatory. (c) Var. *argentea*. Twelve or more large plants in dune slack at TR 36300 57265, part of Sandwich Bay Bird Observatory protected land. (4 *Var. argentea,* TR35T. (5)TR 363 485. (6) *Var. argentea,* TR35T.
Sandwich Bay / Pegwell Bay	TR36	SSSI	2 March 1983	ACH	TR 349 618.

Salsola kali L. (Prickly Saltwort)

vc 15 and (but not recently) 16

Rarity / scarcity status

Prickly Saltwort grows in sand coastal places around the coasts of the British Isles, although as an annual it can be erratic in its appearances and faces pressure through recreational use of beaches. Its conservation risk assessment in Great Britain is **Vulnerable** to the risk of extinction, but in England, 1930-99 data would indicate that decline of this species has been insufficient to warrant a status other than of 'Least Concern'. However, if 1987+ data were assessed as a proportion of all records, including pre-1930 data, then this would show a substantial 39% decline. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. On the basis of records in Philp (2010) it would be assessed as scarce in Kent, but our 2010-24 data indicate that it is verging on scarce. It is being retained in the rare plant register in view of its GB ranking and previous history of scarcity. It is a Kent axiophyte and so is indicative of good habitat.

Sandwich Bay. Photo by Lliam Rooney, 9 July 2010

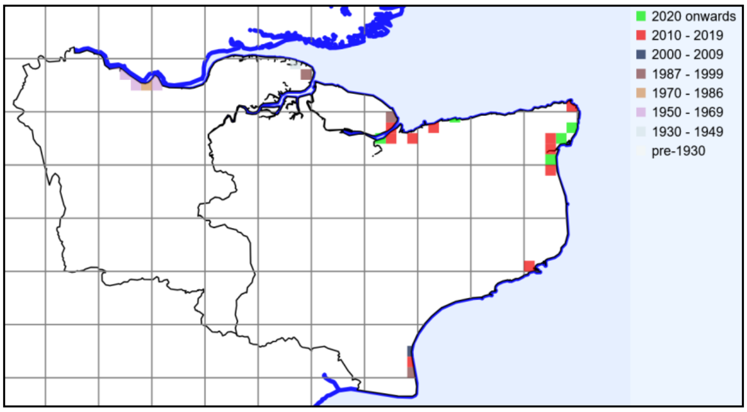
Account

The first Kent record for Prickly Saltwort is by Thomas Johnson (*Iter Plantarum*, 1629), exploring the sea shore from Queenborough Castle, Sheppey. Francis Rose considered that Johnson's plant listing was probably made at the site of present Sheerness, where shell-sand beaches were probably well-developed, as with present-day Grain and Leysdown. The listing included other coastal sand plants such as *Glaucium flavum* (Yellow Horned-poppy), *Euphorbia paralias* (Sea Spurge) and *Eryngium maritimum* (Sea-holly). Johnson also recorded it at Margate (*Descriptio Itineris Plantarum*, 1632). Hanbury & Marshall (1899) regarded it as sufficiently frequent on sandy and shingly shores from Sheppey eastwards and along the north east coast that they did not give individual records: only for outliers at Grain, Folkestone, New Romney and Dungeness.

Francis Rose regarded it as a native of sandy shores, usually along the strand zone, where its seeds are deposited by high spring tides: very local, as the extent of suitable sandy shores is limited. In West Kent, he recorded it as frequent on the north beach of Grain, 1945-71; and it was also reported from the beach west of Allhallows in 1958. In East Kent, he was familiar with it at the eastern end of Sheppey, where common on the shell-sand of Shellness, 1946-56, being long extinct from Johnson's site at the western end, and it was also at Minnis Bay (1946). On the east coast of the county, he knew it at Cliffsend (1945) and as abundant from Shellness in Pegwell Bay to Sandwich Bay (1954). It was reported at Lydden Spout in 1945, and he was familiar with it at Greatstone, at intervals from 1946 to 2000.

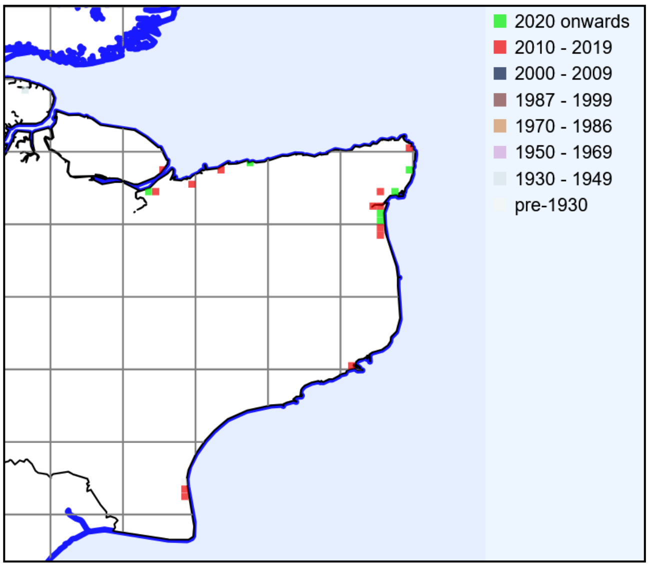
Philp (1982) considered that the species had probably declined during the twentieth century due to pressure on sandy shore habitats, and that it had become rather scarce, with six tetrads recorded 1971-80. These had become seven tetrads by Philp (2010), for the period 1991-2005, most of them different, emphasizing the erratic nature of its occurrences, although constrained by limitations of habitat. Our 2020-24 records, however, are for 15 tetrads (19 monads), so clearly it is not as scarce as had been supposed. This may be a consequence of more effective recording, even though we have not located it recently in West Kent. The last West Kent records have been at Greenhithe (TQ57X, John Palmer 1979-80) and Grain (TQ87Y, Eric Philp 1991-99). The increased number of East Kent sightings may be connected with an increase of records for other strandline species such as *Eryngium maritimum* (Sea-holly) and *Polygonum oxyspermum* subsp. *raii* (Ray's Knotgrass).

Salsola kali **Kent records to 2024 mapped at tetrad level, from BSBI database.**



It is mapped here at tetrad level to show historic losses for which only tetrad records exist; and at monad level to show better resolution, from the period after 2010 when monad recording became the norm in Kent.

Salsola kali **Kent records to 2024 mapped at monad level, from BSBI database.**



Our 2010-24 observations record it as growing on sandy or shingly beaches, generally at the strand-line, including where this extends to the foreshore of dunes. If on shingle, it prefers the presence of some sand as well. Associated flora includes *Atriplex laciniata* (Frosted Orache) and *Cakile maritima* (Sea Rocket). We have also found it on sandy accumulations in man-made habitats, within the fencing of Ramsgate ferry terminal and the neighbouring roundabout on Military Road.

As a strandline annual, *Salsola kali* at least in part has its fruits dispersed by the autumnal and vernal equinoctial tides, with germination geared to take place afterwards, mostly in May and June[717]. Inhibition of autumn germination is likely to arise substantially from the enclosure of the seed in a persistent perianth, which presumably decays over winter, after which temperature and salinity are relevant factors: at certain temperature levels, salinity stimulates germination. The fruits are to a degree buoyant, but experiments showed that all sank within a period of 22 days' immersion and prolonged immersion reduces seed viability.

Sandwich Bay. Photo by Lliam Rooney, 9 July 2010

There are no species with which *Salsola kali* is likely to be confused in its characteristic British habitat, but *Salsola tragus* (Spineless Saltwort) has been treated as a subspecies of *Salsola kali*: it is a relative spineless alien, unrecorded in Kent since 1900 (as *S. kali* subsp. *ruthenica*) or 1923 (as *S. kali* var. *tenuifolius*).

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[717] Ignaciuk, R. & Lee, J.A. (1980). The germination of four annual strand-line species. *New Phytologist* **84**: 581-591.

Salvia pratensis L. (Meadow Clary)

vc 15 and 16

Rarity / scarcity status

Salvia pratensis has few native localities in the British Isles (variously put at around a dozen, or twenty, depending on interpretation), generally in calcareous grassland, scrub or wood-borders, and its status is uncertain or introduced elsewhere. It is **nationally scarce** and treated as **Near Threatened** in both England and Great Britain as a whole. This risk assessment is in England based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 21% and its area of occupancy had similarly declined, so that there was a 21% reduction in the likelihood of recording the species. Reductions in some UK populations as between 1986-88 and 1994 have been noted.[718] It is protected from picking and sale under the Wildlife and Countryside Act 1981 as amended. The main concentration of the species is in Oxfordshire, but there are two, possibly three, current sites in Kent of presumed good native standing, including the classic British location at Ranscombe Farm, Cobham, where it is looked after by Plantlife, and it is **rare** as a native in the county.

Ranscombe. Photo by David Steere, 7 July 2014

Account

Cobham/Cuxton

Hanbury & Marshall (1899) gave the first Kentish record as by Morison in his *Plantarum Historiae Universalis Oxoniensis*, vol.3 (1699): '*in Septa* Cobhamiano Essexiae [sic] *in* Anglia. D. Watsius *detexit*.'[719] However, this is preceded by Leonard Plukenet's *Almagestum Botanicum sive Phytographiae Plukenetianae Onomasticon* (1696), where it is said to have been found recently 'in agri Cantiani Vivario Cobhamense' – 'Vivario' refers to a game preserve or park, and presumably relates to Cobham Park, then divided into the inward or Deer-park and the out park. This is the first British as well as Kentish record and the site became well-known to botanists generally, so that specimens may be found in all the main British herbaria providing a roll-call of distinguished botanists (Boswell Syme, Druce, Henslow, Leighton, Lousley, Pugsley, Salmon, Winch, Wheldon, etc.). The Botanical Society of London conducted an expedition here in 1838, following traditional directions with mixed success, as described in the rare plant register account for *Malva setigera* (Rough Mallow), and 'In a hilly field immediately behind Brick House Farm[720] on the Cuxton Road, which has recently been converted into a fir plantation, we found *Salvia pratensis* and *Rosa Rubiginosa*, particularly at the upper part of the field about forty paces from the hedge bordering it on the left. All over this field *Campanula glomerata* and *Chlora* [*Blackstonia*] *perfoliata* were abundant.'

There are many subsequent old records here, of which these are the more informative:

4 July 1844	Field east of Cobham Park (Edward Palmer).
1889	In some quantity on the south side of Great Wood, Cuxton (A.H. Wolley Dod).
1904	Dry pasture, Cobham (C.E. Pye).
1905	Slopes under Cobham Great Wood (R. Roffey).

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[718] Rich, T.C.G., Lambrick. C.R. & McNab (1999). Conservation of Britain's biodiversity: *Salvia pratensis* L. (Lamiaceae), Meadow Clary. *Watsonia* **22**: 405-411.

[719] In an enclosure at Cobham [Essex in error]. D. Wat[t]s discovered it. [Septa or Saepta has been translated as hedges in this context, but this is not a plural noun, and the sense may be that it was within the park enclosure.]

[720] This was part of Lower Brick Farm, and as Lower Bush Farm does not feature in the Cuxton tithe apportionment schedule, it is likely that these are one and the same.

30 September 1928	West Cobham Park, bank by turnip field (A.R. Horwood).
1943-55	Abundant in rough chalk grassland here for about half a mile along the edge of the wood (n.d.). Abundant for 200yds (1943). (Francis Rose)
12 July 1945	Between the arable fields and the Great Wood, plentiful (R.A. Boniface).

More detailed information was collected once Plantlife initiated a Back from the Brink project for this species in 1994 and English Nature included it in a Species Recovery Programme the same year. The main colony then grew between the Cobham Wood commercial woodland and the fence protecting the adjoining arable field (now the plant grows primarily on the field side of the boundary, as seems to have been the case in some of the earlier records, but essentially it is a transitional habitat between woodland and open field margin). It was damaged in 1997/98 by a forestry vehicle, following the coppicing of adjacent woodland, and direct conservation work was at first held up by ownership complications. In 2000, Cobham was assessed as having between five and ten plants/clumps (although 20 in 1994; 13 in 1995; 19 in 1996).[721]

Ranscombe. Photo by Stephen Lemon, 16 June 2012

The importance of *Salvia pratensis* (in conjunction with the presence of other plants of national significance at Ranscombe Farm) eventually led to the acquisition of Ranscombe by Plantlife in 2005, so that the species has since received the attention on inclusion in a nature reserve. Some of this attention was unwanted, however, in that the population suffered a serious set-back when 12 plants were dug up and stolen on 28 January 2008, even though at that non-flowering time of year they would not have been conspicuous. This theft received national news and BBC coverage.

After the theft, the reduced population was necessarily more vulnerable to survival. A selection of records for the years following is given below, but during this period a study was initiated into how recruitment of seedlings might most effectively encourage the long-term survival of the colony (Moyse, 2017).[722]

9 June 2010	(a) TQ 70216 67949, two plants at margin of woodland and field. (b) TQ 70248 67931, ten plants at margin of wood and field. (c) TQ7068, close on boundary with TQ6968, margin of wood and field. (d) TQ 70170 68001, two plants in open area by track in woodland, ten seedlings on track. (Geoffrey Kitchener)
2012	21 rosettes, adult or immature, distributed in four patches along c.320m of south-facing woodland edge (Richard Moyse). 16 June 2012, three separate areas of flowering plants along the northern edge of Kitchen Field: TQ 70244 67937, TQ 70161 67997 and TQ 69993 68071; c. ten 10 flower spikes (KFC meeting).
20 October 2014	(a) TQ 7016 6799, 93 plants at Twenty Acre Field. (b) TQ 7021 6795, 24 plants at Twenty Acre Field. (c) TQ 7024 6793, 3 plants at Twenty Acre Field (Richard Moyse).
2019	26 flowering rosettes, plus 35 apparently adult but non-flowering rosettes; 44 new seedlings (Richard Moyse).
15 June 2021	TQ701679, Twenty Acre Field, 20 flowering, 59 non-flowering; TQ702679, Twenty Acre Field, 14 flowering;

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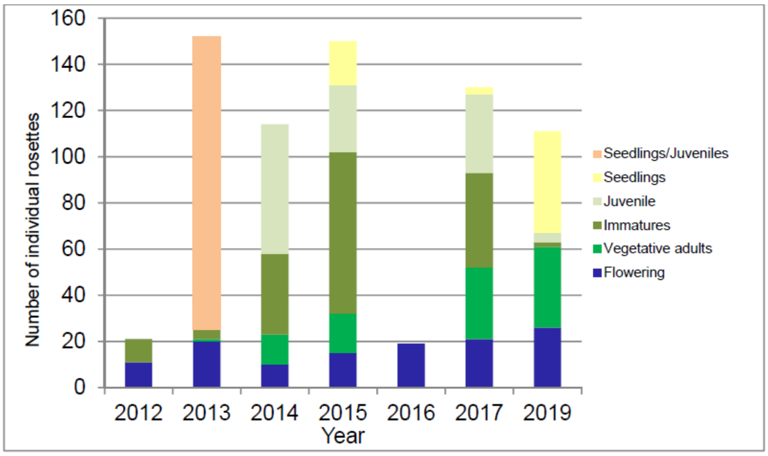
[721] Wheeler, B.R. (2001). Meadow Clary *Salvia pratensis* in 2000. English Nature / Plantlife Report 176.

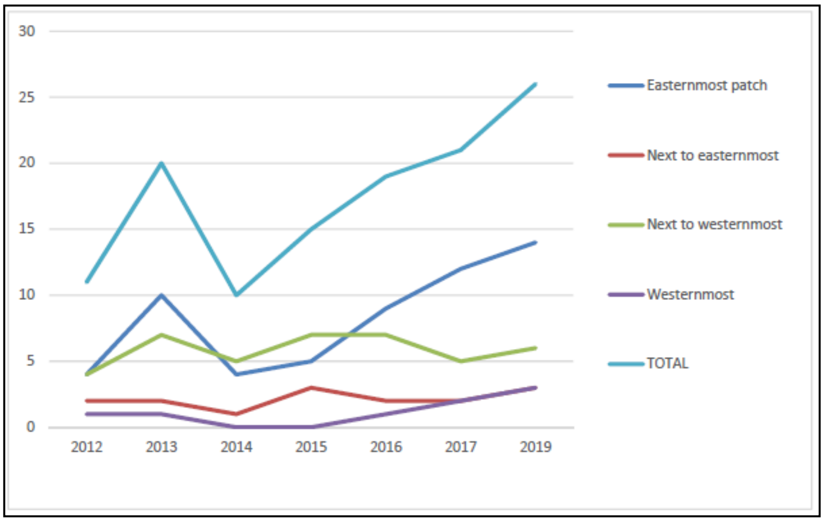
[722] Moyse, R.I. (2017). Response of meadow clary *Salvia pratensis* L. to localised ground disturbance at Ranscombe Farm Reserve, Kent, UK. *Transactions of the Kent Field Club* **20:** 4-10.

	TQ699680, Twenty Acre Field, 1 flowering, 1 non-flowering (Richard Moyse).
21 June 2023	TQ 702 679, five rosettes, including three flowering; TQ 702 679, 23 rosettes, including six flowering; TQ 701 679, 71 rosettes, including 22 flowering; TQ 700 680, four rosettes, including one flowering (Richard Moyse).
	TQ 70169 67997. Grassland/woodland margin, 4 plants (Lesley Mason, Lliam Rooney).

The Ranscombe study sought to address the prospect that an aging population of *Salvia pratensis* could fall into extinction debt, by which the recruitment of new individuals is insufficient to replace older ones. This is especially important as although *Salvia pratensis* plants may, from Dutch studies, live for decades, there is evidence that they may cease to flower towards the end of their life cycle, and there is probably not a persistent seed-bank. In order to encourage seedlings, an area of bare ground was created in July 2013 between existing plants in one of the Ranscombe patches. In July 2014 this was extended, and areas of bare ground created around two other patches. No further treatment was applied in 2015, and in October of that year the position was assessed: 119 seedlings/juveniles remained from germination since July 2013. Some 55% of new plants survived the first year; 42% survived for a second year. After the results given in Moyse (in press), no further disturbance was undertaken in 2016, some small-scale disturbance was carried out in 2017, and again in 2019.



Resultant changes in the population structure are shown in the accompanying table (courtesy of Richard Moyse). The initial flush of seedlings in 2013 can be seen to have matured, developing into juveniles and immature plants (as well as with some losses), as might be expected. Note that only flowering rosettes were counted in 2016. Overall, the population structure has rapidly become more diverse. Although 2017 ground disturbance was not very successful in stimulating germination, the 2019 disturbance resulted in 44 new seedlings. There is a noticeable increase in flowering rosettes, but perhaps not as much as might have been expected if flowering takes place four to five years from the date of germination onwards (subject to reaching a critical rosette size), as Ouborg & Treuren (1994)[723] indicate.



The trends in flowering rosette numbers are given here (table also by courtesy of Richard Moyse). It is possible that the increase for the easternmost patch is at least in part attributable to winter trampling by cattle which may have resulted in branching of established plants, although Stroh *et al.* (2019) state that grazing at other times of year, when flowering shoots are present, may promote growth of small adpressed vegetative shoots but few or no flowering stems.

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[723] Ouborg, N.J. & van Treuren, R. (1994). The significance of genetic erosion in the process of extinction. IV. Inbreeding load and heterosis in relation to population size in the mint *Salvia pratensis*. *Evolution* **48(4)**: 996-1008.

Queendown Warren

This site is a chalk valley slope where a mediaeval rabbit warren was located; Hasted (1798) [724]described it as a long tract of waste ground, disused as a warren for some time past. It was declared a local nature reserve in 1973 and managed by the Kent Wildlife Trust (then Kent Trust for Nature Conservation) from 1977, since becoming part owned by Plantlife. It has enjoyed considerable floral continuity. *Salvia pratensis* was listed by Matthew Cowell as present, with several orchid species, in his *A Floral Guide for East Kent, etc*. (1839). Various botanists including W.H. Beeby, W.W. Newbould and H. Trimen subsequently collected specimens from here, but the site never received as much attention as Cobham and there appears to have been a decline after c.1930, when seen by ‘F. F.’ (Fred Forsyth?).

There are no records for some 30 years after, as Francis Rose’s manuscript *Flora of Kent* (a section probably written in the late 1950s) refers to it as ‘now gone! (it was by the chalk pit at the N.E. end)’. Nevertheless, Francis Rose had apparently seen it there in 1960 and his notebooks pick up its subsequent presence, with four plants (two flowering spikes) seen in 1969; present in 1971; two good clumps in 1993; present in 1994 (one plant is mentioned in a record by Eric Philp and Tim Rich that year); and three clumps noted to the far east of the Middle Bank in 1996. At that time, the population seems to have been emerging from being in recovery, although so far as concerns numbers, it is not always straightforward identifying whether a clump constitutes one or more plants (and flowering spikes may be different yet again). As at 1997/98, there were three separate ‘patches’ of Meadow Clary, constituting about ten plants overall. Subsequently (see selection of records below) the population at Queendown has continued at sustainable levels.

23 June 2001	11 plants supporting 25 flowering spikes, TQ 831 630 (Paul Lazarus).
8 June 2002	11 flowering plants TQ 831 630; one 3m from fence TQ 831 629 (Paul Lazarus & Mike Platten).
14 June 2003	14 plants, the majority flowering or fruiting although some mature non-flowering plants also in evidence (24 flowering spikes), TQ831 630; one at TQ 831 629 (five flowering spikes) (Paul Lazarus).
2 June 2004	(a) TQ 83116 63007, one clump (eight flowering spikes); (13 June 2004), all the flowers checked were fertile. (b) TQ 83178 63036, four plants (one flowering spike). (c) TQ 83187 630[97], ten plants, one new, (18 flowering spikes); (13 June 2004) all the flowers checked were fertile. (d) TQ 83195 63087, one flowering spike. (e) TQ 83206 63093 , two clumps (17 flowering spikes, only 2 left, rest eaten or picked; (13 June 2004) all the flowers checked were fertile. (Paul Lazarus)
11 June 2005	(a) TQ 83116 63007, one clump (six spikes); good healthy population; enter main bank from eastern end, take path into reserve, at fence go over stile and turn down bank 1.5m. (b) [TQ 83178 63036 – no record data] (c) TQ 83187 63079 [NB TQ 83187 63097 was referenced in 2004], nine plants, a good healthy population with one new plant; one main clump (six spikes), nine rosettes (two spikes). Enter main bank from eastern end, take path into reserve, look for large beech on your left, walk on 40m and turn down bank 15m. (d) TQ 83195 63087, one clump (one spike); good healthy population. Enter main bank from eastern end , take path into reserve, look for large Beech on your left, walk on 40m and turn down bank 15m. Walk back to beech 10m. (e) TQ 83206 63093, one plant (one less this year, scrub to be cut back). Enter main bank from eastern end, take path into reserve, look for large Beech on your left, walk on 40m and turn down bank and pick up lower path, walk on 20m. (Paul Lazarus & Selwyn Dennis)
17 June 2006	(a) TQ 83116 63007, one clump found. Enter main bank from eastern end, take path into reserve, at fence go over stile turn down bank 1.5m. This plant had not done well this year, has been damaged, cause unclear, but can be seen clearly from the road. (b) TQ 83178 63036, four adult plants, viz. one clump of four rosettes (no flowering spikes). Enter main bank from eastern end, take path into reserve, look for large Beech on your left, walk on 40m and turn down bank and pick up lower path, walk on 20m. (c) TQ 83187 63079,ten ‘plants’, viz. (i) main clump (19 spikes); (ii) small clump (two spikes); (iii) rosettes (one spike); (iv) small clump (one spike); (v) small clump (one spike); (vi) small clump (one spike); (vii) small clump (two spikes); (viii) rosettes (four spikes); (ix) rosettes (two 2 spikes); (x) rosettes. (d) TQ 83195 63087, one clump (one spike). (e) TQ 83206 63093, two clumps (one with seven spikes and one with one spike). Enter main bank from eastern end, take path into reserve, look for large Beech on your left, walk on 10m and turn down bank 15m {these directions are

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[724] Hasted, E. (1798). *The History and Topographical Survey of the County of Kent*, vol.6. W. Bristow, Canterbury.

	different from 2005]. (Paul Lazarus).
26 May 2018	(a) TQ 8311 6299, four flowering plants, 'the original site beside footpath'. (b) TQ 8318 6307, about 20 rosettes on reserve. (KFC meeting)

Other sites

Apart from the two main native sites there have been other occurrences although, as Hanbury & Marshall (1899) state, the species has always been very rare in Kent. As a native, it is to be expected on banks and rough grassland on chalk. As regards elsewhere, Rich, T.C.G. et al. (1999)[725] state that it has been introduced to many sites in Britain with foreign grain, especially during the period 1880-1930, and it was a regular contaminant of imported grass/clover permanent pasture seed mixtures. Such origins may apply to pre-1899 occurrences in a meadow at **Mersham Hatch** and a hayfield between **West Malling and Wrotham**.

More recent seed introduction probably accounts for a 2019 site along the banks of the HS1 railway line near **Mersham** (rather than any survival from the 19th century Mersham Hatch site, which was ploughed up before 1899). The geology is Lower Greensand Group which, although the presence of the Hythe Formation may account for slightly calcareous content, is far from the species' classic chalky habitat. The railway line was constructed during 1999-2003 and, although seeding was supposed to have been of native species and sourced as much as practicable (some 98%[726]) from woodlands and meadow in Kent and the south and east of England, it is evident from finds elsewhere (e.g. *Trisetum flavescens* subsp. *purpurascens*, a central European subspecies) that seed of foreign origin has been involved.

3 June 2019	TR 056 389, on a very hot, dry, south-facing Ragstone bank of HS1 railway line, observed with binoculars.(Ade Jupp)
16 June 2019	TR 061 387, TR 063 386 and TR 064 385, one plant/clump at each grid-reference, on the hot, dry banks of the HS1 railway line, observed with binoculars. Some of the grassland is still subject to cut and removal of arisings once a year, so there is a possibility of transfer by machinery as well as arrival as seed contaminant. (Ade Jupp)

There are records for **Dover** (Fox Hill Down or Langdon Cliffs) as a possible native site at least since 1949 (TR 335 421), and Francis Rose noted this also in 1954 (specimen in **MNE**) as well as receiving reports from Mrs. K.D. Rowlands (1958) and Mrs. B. Dodds (1960). While it was not found in the county 1971-80 survey (Philp, 1982), there are many subsequent records, but new plants were introduced there in June 2004, and Philp (2010) comments that 'new plants have been planted out (in the name of 'conservation'), so we shall never know if the old population ever survived'. The habitat is very suitable for native occurrence, although it is perhaps surprising that it was so late being discovered in such a well-botanised area[727], but any native status of what is there now has been compromised to a degree. However, the records at the time of planting out (included in the table below) are quite thorough: it appears that there were about a dozen wild clumps, some quite close to the National Trust car park and generally protected by hawthorn. They adjoined the car park on the north and west sides, with outliers further south and also well to the west, between Upper Road and A2.

These are shown on the satellite view below, with the introduction sites given separately. From comparison, it will be seen that, subject to the effect of any natural spread, only subsequent records in the vicinity of the original wild outliers or similarly remote from the introductions have a reasonable chance of representing continuity from the original population. There is an interesting contrast to be made between the respective means taken to promote continuance of the populations at Dover and at Ranscombe, and the difficulties which the former site now presents for crediting future records as native.

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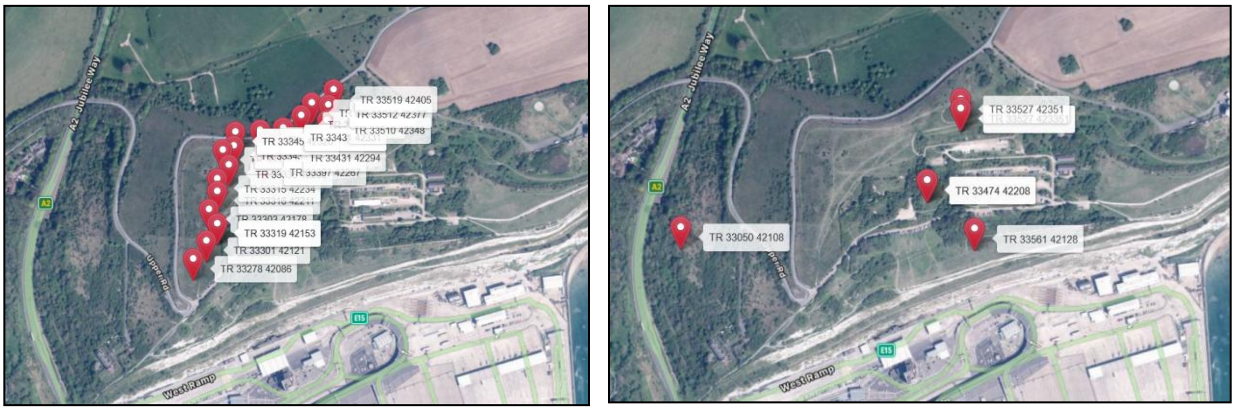
[725] See above.

[726] According to Paul Johnson (2004), CTRL and the Environment, *The Arup Journal*, 1/2004.

[727] Although if it had originated as a planting within Langdon prison/barracks (constructed in the 1880s), this would explain both location and the lateness of discovery.



Dover, *Salvia pratensis* 2004 records: **right,** wild plants; **left**, introduced plants

Including the introduction data, the following table provides a selection of records for the site.

1954	TR 335 422, below barracks west of Langdon Bay, east of Dover, in Tor Grass on chalk cliffs. (Francis Rose)
16 June 1985	TR 340 423. (John Puckett)
11 July 1986	TR 336 423, Langdon Barracks, one plant at the junction of two tracks at the top viewpoint car park. (Rosemary FitzGerald)
1997	Small population on Langdon Cliffs. (Phil Chantler)
19 August 2002	(a) TR 3344 4234, one flowering plant within grazing compartment. (b) TR 3347 4220, Langdon Cliffs, one plant. (c) TR 3350 4210, Langdon Cliffs, two plants, majority of clump flowering/fruiting. (Tim Wilkins)
22 May 2004	(a) TR 33050 42108, four clumps containing 5-15% seedlings/immature, <5% mature non-flowering, 50-75% flowering plants. Located on Langdon cliff bank below first car park. [Also surveyed again on 11 August 2004, protected by hawthorn, no flowering spikes left.] (b) TR 33527 423351, four wild clumps located c. 15m east of cage 4, protected from grazing by hawthorn branches; containing 25-50%seedlings/immature, 25-50% mature non-flowering plants. (Alexandra Jones)
17 June 2004	TR 33474 42208, two clumps, both had 1 sq foot coverage each. Located by hawthorn adjacent to coach park, middle site. 'Wild' protected by hawthorn branches. Clump1 – undamaged flowering spike, still in flower, male OK. Clump 2 – nine flowering spikes, most going to seed. [Also surveyed 11August 2004, when (clump 1) one flowering spike left and seed shed and (clump 2) eight flowering spikes (two broken), est. 200 seeds left on plants.] TR 33527 42351, one 'wild' clump protected by hawthorn branches, approximately 15m east of cage 4; no flowering spikes. TR 33545 42412, one plant (no flowering spikes). TR 33561 42128, one clump sq foot coverage located on bank below first car park, below bench; 'wild', protected by hawthorn branches; six flowering spikes but all severely damaged (rabbits?). [Also surveyed 11 August 2004, when three flowering spikes, no seed left.] (Alexandra Jones)
17 June 2004	**Introductions** TR 335 421. '60. Introduction by seeds. Scattered wild plants'. TR 33278 42086, one clump planted out protected by cage 04/19; two flowering spikes going to seed with one broken. TR 33287 42155, one clump planted out, protected by cage 04/17; five healthy flowering spikes, three quite short. TR 33301 42121, one clump planted out, protected by cage 04/18; healthy three flowering spikes, undamaged male. TR 33303 42178, one clump planted out, protected by cage 04/16, clumps yellowing and not very happy, remains of one flowering spike with no seeds. TR 33316 42211, small clump planted out protected by cage 04/14, suffering from slug damage. [duplicated? by entry for TR 33315 42234, one clump planted out, protected [purportedly also!] by cage 04/14; healthy plants with two flowering spikes in bud.] TR 33319 42153, one clump planted out protected by cage 04/20; healthy six flowering spikes, one broken male. TR 33324 42286, one clump planted out, protected by cage 04/12; healthy population, no flowering spikes. TR 33335 42260, one clump planted out, protected by cage 04/13; healthy with two flowering spikes, one broken, one re-shooting, possibly male sterile as flowers smaller but many are in bud. TR 333431 42294, one clump planted out, protected by cage 04/08; healthy two flowering spikes to seed. TR 33345 42320, one clump planted out, protected by cage 04/11; four flowering spikes, two snapped to seed. TR 33389 42325, one clump planted out, protected by cage 04/10; four flowering spikes , three damaged, male ok. TR 33397 42267, one clump planted out and protected by cage 04/09; four flowering spikes, one damaged to seed. TR 33431 42294, one clump planted out, protected by cage 04/08; healthy two flowering spikes to seed. TR 33431 42331, one healthy clump planted out, protected by cage 04/07; three flowering spikes all damaged. TR 33345 42320, one clump planted out by cage 04/11, four flowering spikes, two snapped to seed. TR 33463 42355, one healthy clump planted out and protected by cage 04/06, one flowering spike to seed.

	TR 33431 42331, healthy clump planted out, protected by cage04/07, three flowering spikes all damaged. TR 33482 42379, one clump planted out and protected by cage 04/05; one flowering spike to seed. TR 33510 42348, one clump planted out protected by cage 04/04. Very unhealthy population (yellowing/dry), four flowering spikes, one broken likely to die (unlucky transplantation). TR 33512 42377, one, healthy plants protected by cage 04/03; two flowering spikes to seed. TR 33519 42405, one clump protected by cage 04/01; healthy, three flowering spikes to seed. (Alexandra Jones)
11 August 2004	TR 3347342207, plant on bank next to coach park, seed sampled for Kew Millennium Seed Bank. (Alexandra Jones)
22 June 2007	(a) TR 334 422, ten plants, SAC, SSSI chalk grassland, AONB, mechanically cut and arisings removed, favourable condition. At present hawthorn is used to prevent grazing damage by rabbits (and is unobtrusive) but will use cages for 2008. (b) TR 334 423, 22 plants, all were (apart from two clumps) were planted in May [sic] 2004 and are caged to prevent grazing damage from rabbits. Clumps were counted: 37 flowering spikes. SAC, SSSI chalk grassland, AONB, grazed by Exmoor ponies over winter months; favourable condition. (Robert Sonnen)
12 July 2010	(a) TR 33468 42203, four plants close to Visitor Centre, vulnerable from rabbit grazing, origins noted as questionable [rightly so; it is close to an old 'wild' site, but planting had taken place near by] (b) TR 33504 42108, five plants in grassland currently under a mowing regime [this appears to correspond to an original 'wild' site]. .(KBRG meeting)

Lost Kent sites include **Boxley Warren**, which Francis Rose regarded as a native site, where Meadow Clary grew in chalk grassland at the lower edge of woods. First noted by Hubert Elgar in 1917, it was seen by Cyril West in 1944, and a specimen gathered by Ted Lousley in 1948 is associated with the comment that there was a large patch which never flowers, due to rabbit attacks. Francis Rose knew it from 1944 to 1955 at least; it is noted in the 1971-80 county survey (Philp, 1982), and there is also a sighting by Rosemary FitzGerald in 1986 (TQ 774 596, one flowering clump in a small clearing in scrub just west of the main footpath through Boxley Wood). The last record appears to have been in 1997. There are records on the chalk, or possibly so, by Farnborough churchyard (1936-44, extinct by 1946); Biggin Hill (1950); downs above Otford (before 1960; destroyed); Trottiscliffe (c.1930); Thurnham hills near the castle (1904, perhaps related to Detling Downs, c.1935, quite possibly native) and chalk scrub north east of Gravel Castle, Barham (where seen by Jocelyn Brooke and Francis Rose in 1939, a good case for being native, but ploughed up in 1950).

Ranscombe. Photo by Lliam Rooney, 9 June 2010

Ecology[728]

Meadow Clary is a long-lived plant, reproducing by seed and but also spreading out as rosettes from vegetative shoots which make it difficult to interpret how many plants there may be in a patch. Populations can include hermaphrodite plants (male fertile) and female plants (male-sterile, with abortive stamens, shrunken anthers and shorter flowers overall), sometimes as different shoots on the same plant. The species is self-compatible via insect pollination, but predominantly outcrosses through a range of bee and other insect species; outcrossing results in progeny with higher survival rates.

Seed production in English populations is supposed to be some 1,500 per plant. A non-random sample of four flowering plants at Ranscombe produced an average of 262 flowers per plant, with potential (at four ovules per flower) for more than 1,000 seeds per season (Moyse,2017). Seeds each weigh over 2mg and, being relatively heavy, are unlikely to fall far from the parent plant; although they are mucilaginous, enabling attachment to animals, they are not likely to come into contact while still enclosed by the calyx, but the calyx with its sticky glandular hairs could adhere to grazing animals. The mucilage may be more effective in anchoring to soil particles preliminary to germination. Moyse (2017) gives a map of the scatter of seedlings over a 2.5 x 1.2m disturbed area and the presence of open ground clearly encouraged germination. Seedlings had already been observed at Ranscombe (2010) on a woodland track, but the disturbance which presumably created the germination opportunity was likely to continue and be prejudicial to survival. There are no observations as regards seedlings at Dover, but the difficulties with rabbit grazing which led to the caging of introduced plants ought in theory to have also had the benefit of providing favourable conditions for seedling establishment, with rabbit scrapes providing suitable niches[729].

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[728] The main sources for non-Kent data here are:

(1) Stroh et al. (2019). Grassland plants of the British and Irish lowlands: ecology, threats and management. Botanical Society of Britain and Ireland, Durham.

(2) King, M. (2004) *Salvia pratensis* (Plantlife species dossier), http://adlib.everysite.co.uk/resources/000/091/214/MC_dossier.pdf

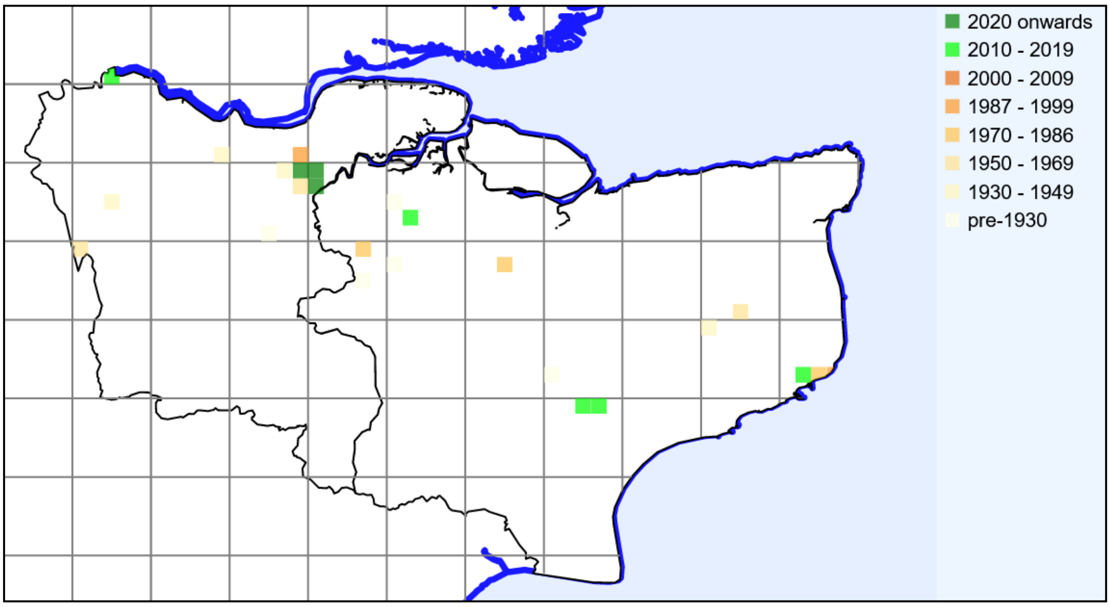
(3) Moughan, J., McGinn, K.J., Jones, L., Rich, T.C.G., Waters, E. & de Vere, N. (2021). Biological flora of the British Isles: *Salvia pratensis* (No. 297). *Journal of Ecology* **109**: 4171-4190.

Meadow Clary's habitat preference for well-drained calcareous soils with a sloping, southern aspect probably reflects its position at the edge of a Continental distribution which diminishes considerably in the west: although it is a plant of meadows with a wider range of soils in central and eastern Europe, presence in a meadow in Kent would normally be indicative of introduction. It is sold as wildflower seed.

Description

Salvia pratensis is a distinctive sage-scented herb, rosette-forming with stems up to 90cm bearing whorls of violet- or dark- blue flowers, sometimes pale blue. It may be distinguished from *Salvia verbenaca* (Wild Clary) in that the latter is generally a smaller plant, especially in corolla size, and may be found on more sandy soils. The longest calyx hairs of *S. verbenaca* are white and non-glandular (it has short glandular hairs as well), whereas the longest calyx hairs of *S. pratensis* are brownish and glandular (it has short non-glandular hairs as well). The lower leaves of *S. verbenaca* vary but may be distinctly lobed; those of S. *pratensis* are rarely shallowly lobed and normally at most doubly-serrate.

***Salvia pratensis* Kent records to 2024 mapped at tetrad level, from BSBI database.**



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[729] Wigginton, M.J. (1999). *Salvia pratensis* L. (Lamiaceae), in *British Red Data Books 1 Vascular plants*, JNCC, Peterborough.

Salvia verbenaca L. (Wild Clary)

vc 15 and 16

Rarity / scarcity status

Salvia verbenaca (subsp. *horminoides*) is a not uncommon perennial of dry and rather bare ground, roadsides and dunes, largely absent from Scotland, Ireland and central Wales. Its risk assessment for Great Britain is one of 'Least Concern'; but for England it has from 2014 been treated as **Near Threatened**. A comparison over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 21% reduction in the likelihood of recording the species, which is just sufficient to be concerning, despite its remaining fairly widespread. In Kent, it is neither rare nor scarce. There is evidence of a 31% decline between 1971-80 and 1991-2005, although 2010-24 data do not support this. It is a Kent axiophyte and so is indicative of good habitat.

Greatstone. Photo by David Steere, 19 May 2019

Account

The first Kentish record for *Salvia verbenaca* is by Charles de l'Écluse (Clusius) in his *Rariorum Plantarum Historia* (1601), where he refers to a visit to England in 1579, when he discovered it at Greenwich, frequent enough at the racecourse of the royal principal place[730], beginning flowering in September, then laden with seed. Hanbury & Marshall (1899) described the species as a native of dry banks; 'frequent, though decidedly local'. The records which they collated were particularly numerous in north west Kent. Habitats included roadsides and lanes, dry banks, sandhills, waste land and notably churchyards: Bromley, Farnborough, Plumstead, Crayford, Davington, Ore, Minster in Thanet, East Malling and Lydd. In or near churchyards were records from a lane by Charlton Church, by Darenth Church, near Harbledown Church; and Forster's *Flora Tonbridgensis* (1816) cited Wild English Clary as 'Not uncommon in churchyards and stony places', although giving a Sussex churchyard example. Churchyard occurrences have been attributed to mediaeval sowing, although documentary support for this is extremely limited.[731]

Reculver. Photo by Lliam Rooney, 28 April 2010

Francis Rose noted it as a native of 'dry pastures, roadsides, churchyards, and banks especially on sandy, chalky or gravelly soils; fixed dunes and shingle beaches; rather common on and near the coast and near tidal estuaries, rare inland'. The churchyards which he noted were Minster in Sheppey, Blean, Stone, Darenth and Shoreham. The county 1971-80 survey (Philp, 1982) found *Salvia verbenaca* to be rather local but often quite frequent where it does occur, and there were distribution clusters in north west Kent, around Rochester, at Thanet and around Sandwich, and from Sandgate to Lydd. The total of 54 tetrads then recorded were much reduced in the 1991-2005 survey (Philp, 2010), down to 37 tetrads, in spite of increased coverage at Dungeness. Ostensibly, this would appear to be a significant decline, but it is not borne out by 2010-24 recording, which shows a total of 63 tetrads (72 monads), although some records (7 tetrads) belong to metropolitan West Kent, which was not covered by Philp(1982) or (2010).

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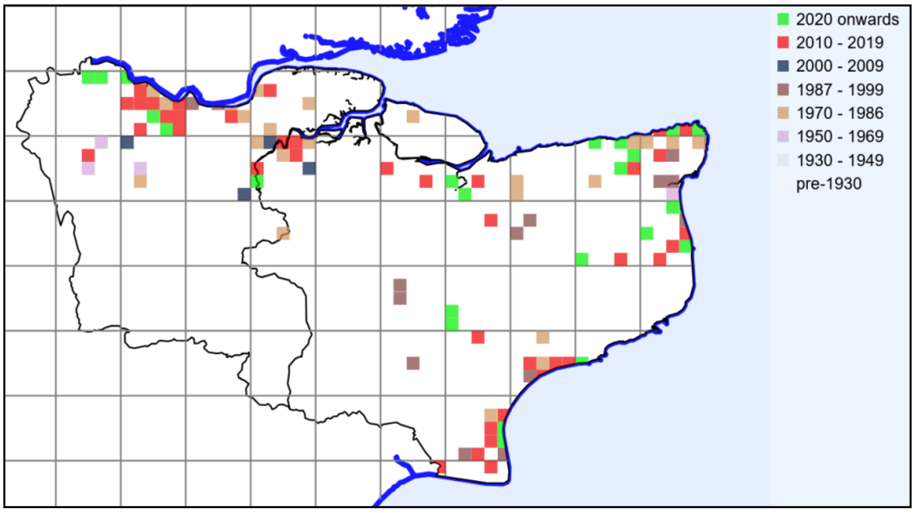
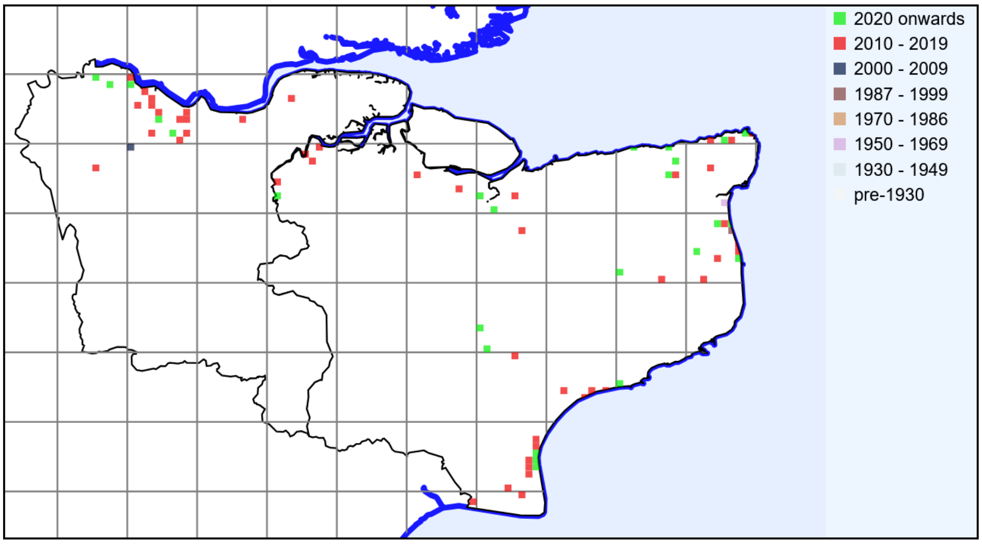
[730] '*satis frequentem ad Regiae arcis Hippodromum inveniebam'*. The royal establishment here would be Greenwich Palace and, while *Hippodromum* translates as racecourse, this may have been Henry VIII's tiltyard.

[731] Sturt, N. (1995) Wild Clary(*Salvia verbenaca*)in churchyards. *BSBI News* **68**: 28-29. Abraham, F. (1995). Wild Clary(*Salvia verbenaca*) in churchyards. *BSBI News* **69**: 28.



***Salvia verbenaca* Kent records to 2024 mapped at tetrad level, from BSBI database.**

It is mapped here at tetrad level to show historic losses for which only tetrad records exist; and at monad level to show better resolution, from the period after 2010 when monad recording became the norm in Kent.



***Salvia verbenaca* Kent records to 2024 mapped at monad level, from BSBI database.**

Comparison with Philp (2010) suggests that the 1991-2005 survey has under-recorded generally, including a hot-spot area in TQ57, north west Kent. It is possible that some more recent records come from deliberate sowing in the wild: this was suspected at Gillingham (TQ7769) and at arable margins at Barfreston (TR2650) and East Studdal (TR3250). Recent records include churchyards at Hythe, Mersham, Monkton Stone and St. Paulinus (Crayford); given persistence of habitat, it would be worth checking other churchyards with older records for continuity.

Greatstone. Photo by David Steere, 19 May 2019

Our Kent plant is *Salvia verbenaca* subsp. *horminioides* var. *horminioides.* It has variable corollas: those which are relatively conspicuous, measuring 10-17mm, will encourage pollination by bees (although there is capability for selfing, if out-crossing pollen is not received early on)[732]. Less conspicuous flowers, with corollas 6-12mm, are cleistogamous and so will set seed without insect intervention, although the seeds are lighter and may not be as advantageous for germination and initial growth.

The largest flowers of *Salvia verbenaca* slightly overlap in size with *Salvia pratensis* (Meadow Clary) and differences between the two species are given in the account for the latter.

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[732] Navarro, L. (1997). Is the dichogamy of *Salvia verbenaca* (Lamiaceae) an effective barrier to self-fertilization? *Plant Systematics & Evolution* **207:** 111-117.

Sambucus ebulus L. (Dwarf Elder)

vc 15 and 16

Rarity / scarcity status

Sambucus ebulus is an archaeophyte, or ancient introduction, which grows scattered over much of the British Isles, on waysides and waste ground. Its conservation risk assessment is one of 'Least Concern'. However, despite a reputation for persistence by virtue of its long, creeping, branched rhizomes, it is considered to show a 49% decline in England if 1987+ data are viewed in relation to all previous records, including before 1930. Its wayside and waste habitats are presumably susceptible to tidying up and development. In Kent, it is **scarce**.

Boughton (Brickfield Lane). Photo by Lliam Rooney, 18 July 2010

Account

The first Kent record is by John Gerard in his *Herball* (1597): 'Dane woort[733] growth in untoyled places neere common waies, and in the borders of fields: it groweth...in a field by S. Jones [S. *Joans* in the 1633 edition; this is probably St. John's Jerusalem, Sutton-at-Hone] neer Dartford in Kent'. Presence in this locality continued at least until the late nineteenth century when A.H. Wolley Dod noted it by the 'Lane leading from Sutton to the Darenth River'. Other early records include Thomas Johnson's after-dinner encounter with it in abundance at Gillingham churchyard (*Iter Plantarum*, 1629: no longer present). James Petiver also noted it, as he travelled from Canterbury in the course of a botanical tour with James Sherard in 1714[734]: 'we observed *Ebulus* plentifully near a town about three miles before we came to Faversham'. Edward Jacob's record 'By the Road sides near Boughton Street – not uncommon' (*Plantae Favershamienses*, 1777) is presumably the same, Boughton Street being some three miles from Faversham on the (then) Canterbury Road. *Sambucus ebulus* is still abundant here (2014).

Boughton Street (the 1714 site). Photo by Lliam Rooney, 15 August 2017

Hanbury & Marshall (1899) gave a range of records, treating it as a local denizen of roadsides, hedges and pastures, usually near ruins including Queenborough Castle ruins, St. Radigund's Abbey, Reculver and Cooling Castle. Presence near ancient buildings was also a characteristic recognised by Francis Rose and is not unexpected for an introduced species. He recorded the species in 1941 and 1961 at a roadside south of Cooling Castle, with continuity from Marshall's pre-1899 sighting; this was still there in 2014. He also noted it as abundant near Stowting Church in 1947, which picks up G.E. Smith's observation of Dwarf Elder at Stowting, probably between 1830 and 1832[735]. Another record with continuity is that supplied from the papers of Dr. R.E. Hunter (d. 1824) for Matthew Cowell's *A Floral Guide for East Kent, etc*. (1839) as at the '*bottom of the hill from Birchington to Brook-end*'. Francis Rose's manuscript *Flora of Kent* gives a report by

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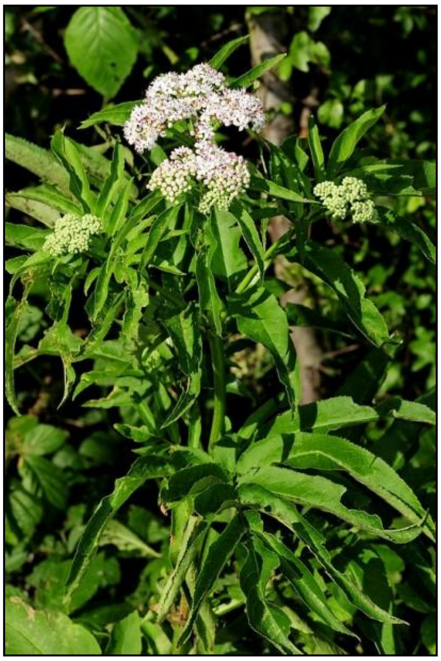
[733] The use of the term Dane-woort is explained by John Parkinson in his *Theatrum Botanicum* (1640): 'It is supposed it took the name Danewort, from the strong purging quality it hath, many times bringing them that use it unto a fluxe, which then we say they are troubled with the Danes'.

[734] Published in *Phytologist* (1862) **6**: 114-120.

[735] From his manuscript notes, upon which Matthew Cowell drew for *A Floral Guide for East Kent, etc. (*1839).

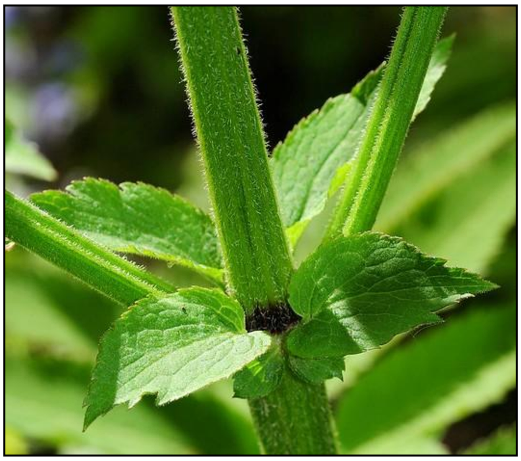
Miss B. Nash of it still being here at a roadside in 1957; this has continued at least to 2013. The manuscript Flora also notes losses: the plant had apparently gone by 1958 from Radfield near Bapchild where Miss E.M. Burrows had seen it in 1932. This was a roadside location whose history went back to 1661.

Philp (1982) considered Dwarf Elder to be rather local and scarce: only seven tetrads were recorded, three of them in TQ55 (south west and north Sevenoaks). Four of these sites were re-found for Philp (2010), but only six tetrads in the county overall were noted. However, for 2010-24, we have the same number of tetrads, six (seven monads), and it may yet be possible to recover one or two more old sites.



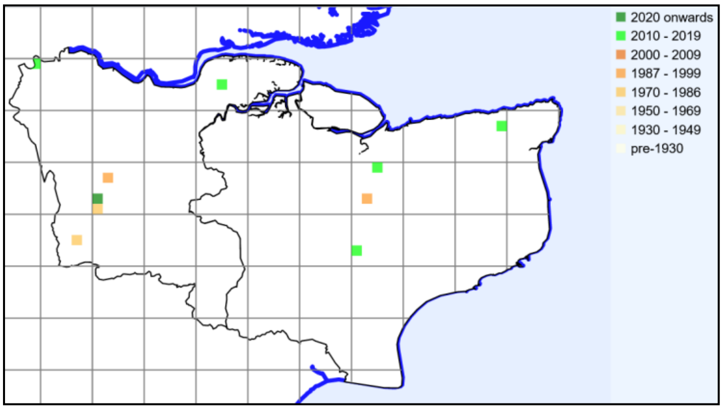
Boughton (Brickfield Lane). Photo by Lliam Rooney, 18 July 2010

Sambucus ebulus has, if not native, been long introduced in the British Isles (there are Saxon references to it, generally as walewort) for its traditional uses, as a medicinal and dye plant, although it seems not to have achieved formal status in the British Pharmacopoeia. It is a perennial which spreads by horizontal underground rhizomes sending up annual stems to form large colonies, so that once it has gained a foothold in a hedgerow (and many of its appearances are of a wayside nature) it would be a matter of great difficulty to remove it. This degree of persistence accounts for the longevity of many of its sites, as in some of the Kent localities described above. It is unclear to what extent, if at all, it may spread here by seed (Sir Edward Salisbury noted how established colonies were more or less continuous with a sparsity of isolated outliers and a lack of observed seedlings[736]).



Boughton Street, stipules. Photo by Lliam Rooney, 26 May 2013

As regards identification, it might be mistaken at a hasty glance for *Sambucus nigra* (Elder), but it does not develop into a shrub/tree, the stems being annual; its leaves have (5)7-13 leaflets in comparison with Elder's (3)5-7 leaflets; and it has conspicuous stipules.



***Sambucus ebulus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

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[736] Salisbury, E.J. (1975).Does *Sambucus ebulus* reproduce by seed in Britain? *Watsonia* **10**: 293.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Greenwich north (metropolitan vc16)	TQ3979		17 October 2015	LNHS meeting (NB)	
Erith Marshes (metropolitan vc16)			1999	RMB	TQ 490 800, north side of Eastern Way.
Hever	TQ44S		After 1970, before 1981	Philp (1982)	[There is a 1953 record for roadside west of Hever Church, seen FR (specimen in **MNE**).]
Sevenoaks Weald	TQ55A		After 1970, before 1981	Philp (1982)	TQ55A.
South west Sevenoaks	TQ55B, includes TQ5153		(1) 5 August 2020 (2) After 1970, before 1981	(1) GK (2) Philp (1982)	(1) TQ 514 535, for c.5m alongside forestry track, Mill Bank Wood. (2) TQ55B.
North Sevenoaks	TQ55I		(1) 1991-99 (2) After 1970, before 1981	(1) EGP (2) Philp (1982)	TQ55I. [May have been Sevenoaks Wildlife Reserve.]
Horton Kirby	TQ6957		May 2005	JF	Horton Kirby Paper Mill.
Cooling Street	TQ77M		(1) 28 September 2014 (2) 1991-99 (2) After 1970, before 1981	(1) SP, DG (2) EGP (2) Philp (1982) {AGS, KCS, EGP)	(1) TQ 754 756, scattered along roadside verge. Known here for many years. (2) & (3) TQ77M. [Records go back to pre-1899.]
Ashford	TR04B		(1) 1 September 2010 (2) 28 July 2005	(1) HS (2) EGP, DG	Near Ashford International Station, TR 014 421, on a bank by the footpath spreading over an area of c.25m in length and up to 3m on the bank. (2) TR04B.
Molash Church	TR05G		(1) 1991-99 (2) After 1970, before 1981	(1) EGP (2) Philp (1982)	
Boughton Street	TR05P (includes TR0578, TR0559)		(1) 9 July 2014 (2) 2 June 2012 (3) 14 June 2010 (4) 1991-99	(1) DAB (2) LR (3) LR (4) EGP	(1) (a) TR 0572 5864, Brickfield Lane, several stems emerging from steep roadside bank at woodland edge. (b) TR 0532 5950, scattered stands cumulatively covering 35 sq m, edge of stream. (2) 1000+ plants from TR 05262 59546 to TR 05293 59532. Masses besides and on a footpath that runs parallel to a stream and the A2 by-pass. Most were concentrated around a drain tunnel that runs under Stockers Hill, Boughton under Blean. 12 more plants at TR 05238 59572, the other side of Stockers Hill around the drain. (3) TR 057586. 57 plants on the south facing bank on Brickfield Lane. A 16m stretch with 2 lone plants and two patches; one of 4m and the other of 7m. (4) TR05P, understood to have been the same site as in (2) above, in TR0559. [Records go back to 1714.]
Brooks End, Birchington.	TR26Y (includes TR2967]		(1) 14 June 2022 (2) 25 May 2013 (3) 1991-99	(1) CO (2) LR (3) EGP	(1) In hedgerow around junction of A28 and Seamark Road. (2) 36+ plants from TR 29355 67892 to TR 29352 67874 by the side of Seamark Road near Acol. 100+ plants from TR 29311 67896 to TR 29338 67907 by the side of a pond and the A28 Canterbury Road near Acol. (3) TR26Y. [Records go back before 1824.]

Sanicula europaea L. (Sanicle)

vc 15 and 16

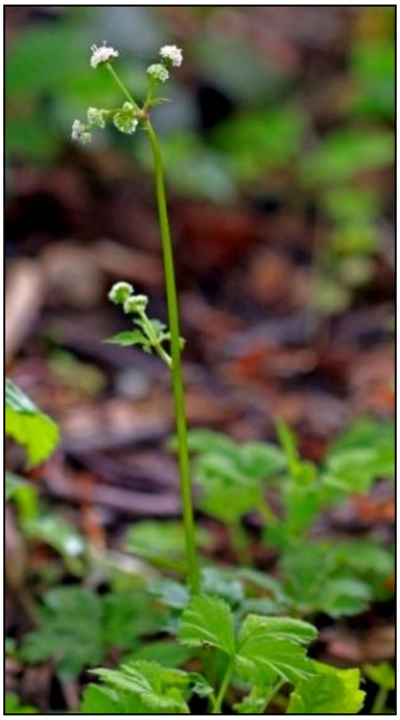
Rarity / scarcity status

Sanicula europaea is an ancient woodland indicator species, found throughout the British Isles in suitable habitat. In Great Britain as a whole, its conservation risk status is one of 'Least Concern'. In England, however, it has been treated as **Near Threatened**, not because of any current scarcity, but a comparison over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 27% reduction in the likelihood of recording the species. In Kent, it is an axiophyte, or indicator of good quality habitat, and is neither rare nor scarce, but there is evidence of decline since 1971-80.

Account

Hanbury & Marshall (1899) give the first Kent record of *Sanicula europaea* as by Thomas Johnson (*Descriptio Itineris Plantarum*, 1632). They state that this was in course of Johnson travelling between Nash (near Margate) and Queakes (Quex), but this seems to be a misreading of the text. Johnson and his fellow apothecaries were staying at the inn of Richard Pollard at Margate and from there botanised around Margate fort; following which they were guided to Nash Court and returned to the inn for dinner (an early afternoon meal then), afterwards setting off for Quex; so Sanicle was found between Margate and Quex, or at Quex. It is a surprising record, however, given the absence of ancient woodland on Thanet, now and for long past[737], and the absence of any modern record. The only other species of comparable habitat which Johnson recorded here was *Daphne laureola* (Spurge-laurel), possibly still at Quex.

There is, however, an earlier record and one with a clearly characteristic habitat, and that is in John Gerard's *Herball* (1597), given in the course of describing *Neottia nidus-avis* (Bird's-nest Orchid) found in the middle of a wood near Hook Green, Southfleet (for further details see the register account for that species). At the orchid's location 'the ground is covered all over in the same place neere about it with the herbe Sanycle'. Elsewhere he comments: 'It groweth in shadowy woods and copses almost every where, it joieth in fat and fruitefull moist soile'.



Ranscombe. Photo by David Steere, 17 May 2016

Hanbury & Marshall (1899) considered Sanicle to be so common that they gave no records for it. Only the earlier Flora writers who aimed at completeness of record for an area mentioned it, and then cursorily, e.g. Edward Jacob (*Plantae Favershamienses*, 1777) '*In Woods – very common*'; Thomas Forster (*Flora Tonbridgensis*, 1816) 'In woods, very common'; Edward Jenner (*A Flora of Tunbridge Wells*, 1845) 'Woods, common'. Francis Rose considered it to be a native of 'old woodlands; abundant in the chalk woodlands, especially in dense beechwoods on slopes, where it is often dominant in the herb layer frequent on base-rich clays and loams on the Gault, and on the Hastings Beds; plentiful in woodlands on ragstone soils; less common on sands and heavy clays, avoiding base-poor soils; extremely shade-tolerant, in fact shade-demanding'.

Philp (1982) found it present in 314 tetrads, in beechwoods on the chalk and oakwoods on well drained loams elsewhere: it was noticeably absent from the marsh districts of north Kent, including the Hoo peninsula and

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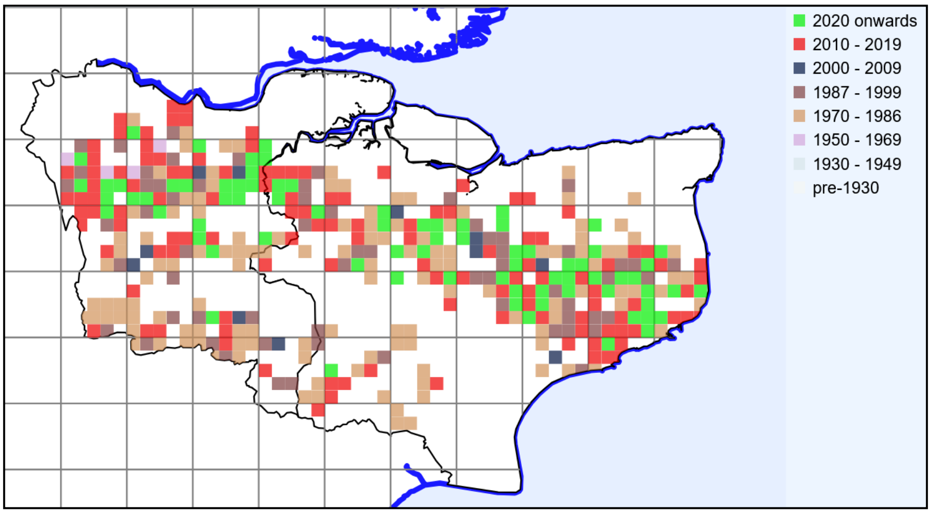
[737] By the time of Edward Hasted, he was able to say (in *The History and Topographical Survey of the County of Kent*, vol. 10. 1800) that only from place names could one tell 'that there was antiently much more woodland in this island than at present; but whatever there was, almost all of it has been grubbed up and converted into tillage'.

Sheppey, from Thanet, Romney Marsh and from areas of Weald Clay across the county. However, Philp (2010) shows a substantial decline (46%), to 171 tetrads, for the period 1991-2005; a general thinning-out. This earlier decline is endorsed by our 2010-24 records, which total 197 tetrads (257 monads), but which suggest levelling off, given that some 19 of those recent 197 tetrads were in metropolitan West Kent and so not included in coverage by Philp(2010).



Sanicula europaea **Kent records to 2024 mapped at tetrad level, from BSBI database.**

The reasons for decline are not immediately apparent. There do not seem to be woodland losses sufficient to account for this; any reduction in coppicing should not affect, because the plant is shade-loving. As the decline has also been a national one, resulting in the plant's Near Threatened status (albeit that *Plant Atlas 2020* considers that its distribution has stabilised), the cause is presumably similarly wide-reaching, and although *Plant Atlas 2020* attributes 20th century losses to a decline in broad-leaved woodland, issues arising from changes in climate or air quality should be considered. Atmospheric nitrogen deposition, which may affect species of infertile soils, does not seem likely to apply here (cf. Gerard's reference to a 'fat and fruitefull moist soile'). Summer droughts would be capable of affecting flowering the year after and may be an important factor in the mortality of young plants[738]. Also, there may be competitive issues if the dense carpet of *Hedera helix* (Common Ivy) so often found in such woodland is being favoured for some reason. Whatever the cause, it may well apply also to *Oxalis acetosella* (Wood-sorrel), a woodland species showing a 30% decline in Kent between the 1971-80 and 1991-2005 surveys.

Otford. Photo by David Steere, 22 May 2016

Our 2010-24 observations do not say much about associated flora in Kent, although this is in any event limited by tree shade. Even though many sightings are given for pathsides, and some are for roadsides, it is not necessarily the case that the habitat is more open than for woodland occurrences. Populations have been noted over an area of 30 square metres at Trosley Country Park, well over 100 plants concentrated in an area of

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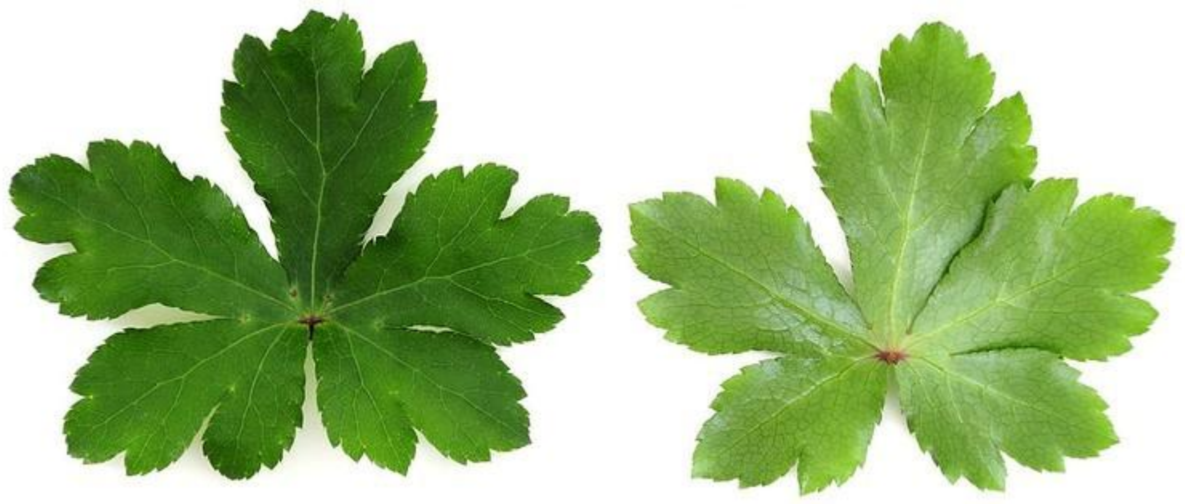
[738] Inge O. & Tamm, C.O. (1985). Survival and flowering of perennial herbs. IV The behaviour of Hepatica nobilis and Sanicula europaea on permanent plots during 1943-1981. *Oikos* **45**: 400-420.

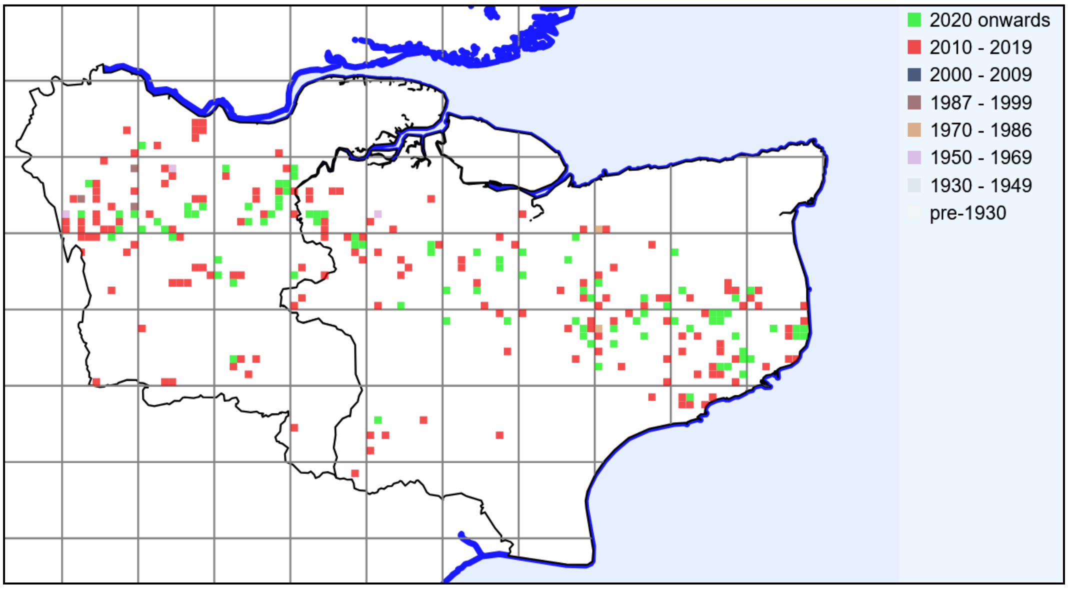
Hartley Woods, and along 200m of path at Bredhurst Woods; but on the whole, sightings appear to be of few and scattered plants. Swedish studies[739] suggest that there is considerable irregularity in the flowering of Sanicle (so that they have 'flowering years' as with some trees), together with very high mortality of seedlings. Coupled with the longevity of individual plants (which may have a half-life of over 50 years), then it may be that recruitment of populations should not be taken for granted. Pollination is by small flies (see illustration) and beetles, although self-pollination is possible.

Sanicle is not readily capable of being confused with any other British species when in flower. When in leaf only, there may be a resemblance to some forms of basal leaf of various microspecies of *Ranunculus auricomus* (Goldilocks Buttercup), found in similar habitats. The latter, however, has mostly smaller leaves, of thinner texture and lacks Sanicle's bristle tips to the leaf lobes.

Sanicle leaves from Larkey Valley Wood. Photo by Lliam Rooney, 30 May 2015



***Sanicula europaea* Kent records to 2024 mapped at monad level, from BSBI database.**



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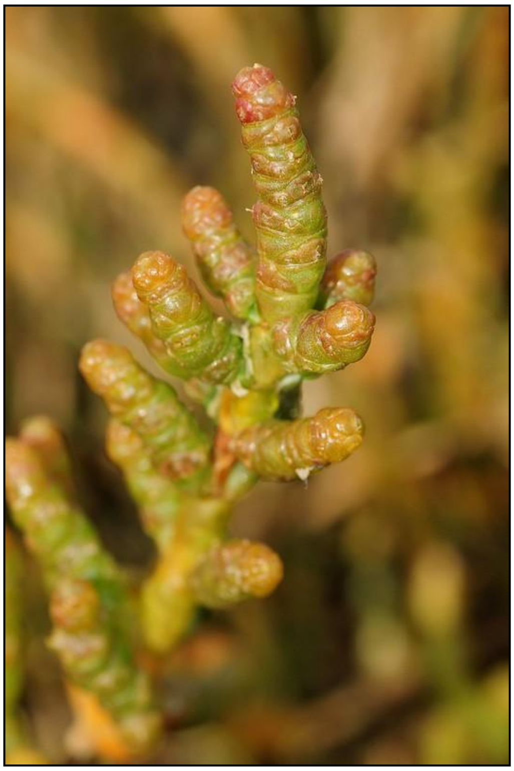
[739] Tamm, C.O. (1956). Further observations on the survival and flowering of some perennial herbs, I. *Oikos* **7**: 273-292. Cf. also Harper, J.L. (1967). A Darwinian Approach to Plant Ecology, *Journal of Ecology* **55**: 247-270.

Sarcocornia perennis DA.J. Scott (Perennial Glasswort)

vc 15 and 16

Rarity / scarcity status

Sarcocornia perennis is a succulent perennial of saltmarshes in the south and east British Isles, especially on the coast of Hampshire, around the Wash and from Suffolk, down through Essex and along the north Kent coast. It is **nationally scarce**, but its threat assessment for conservation risk purposes is one of 'Least Concern'. In Kent, it is neither rare nor scarce. There is possible evidence of decline in the county between 1971-80 and 1991-2005, but this has limited support from later records. It is a Kent axiophyte and so is indicative of good habitat.



Oare. Photo by Lliam Rooney, 30 September 2010

Account

The first Kent record of Perennial Glasswort is from Sheppey: 'There was observed near the island of Sheppey by Dr Sloane a geniculate glasswort or another new perennial species of glasswort' (*Kali geniculatum majus sive alia nova species Kali perennis a D. Sloane observatum est prope insulam Shepey*). This was given in the Appendix of additions in vol.2 of John Ray's *Historia Plantarum* (1688), the record being too late for inclusion in the first volume (1686). The finding was communicated by Dr. Hans Sloane in a letter to Ray dated 10 August 1686[740]. 'In our simpling journey to Sheppey we found a perennial Kali differing somewhat from that on the Mediterranean shores; and Mr. Watts assures me it is a perennial. It grows near King's Ferry, in Sheppey, where also is cast upon the shore the *Fucus spongiosus Ger. emac*. In the same place, in the ditch, grows plentifuly *Atriplex maritima folio sinuato candicante angusto*…I send you down specimens of them' Ray replied on 24 August: 'The *Kali geniculatum*, I agree with you and Mr. Wattes to be different from that of the Mediterranean shores, and a new species, as far as I can discern from the dried plant'.

Harty, habitat. Photo by Lliam Rooney, 2017

This correspondence shows not only the contemporary network for exchange of botanical information, but also how discoveries were bound up with herbal investigations for medicinal purposes. The find was on a 'simpling' (i.e. herborizing) expedition, just as Johnson had undertaken with his fellow apothecaries in 1629 and 1632. Hans Sloane had already taken his MD at the University of Orange, and his interest in botany helped him to membership of the Royal Society in 1685. He had a close association with Chelsea Physic Garden, the curator then being John Watts, whose opinion on the perennial status of the plant was obviously worth having (and who had helped, or promised to help, Ray with information regarding rare plants).

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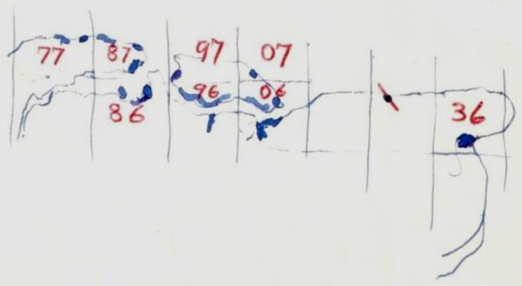
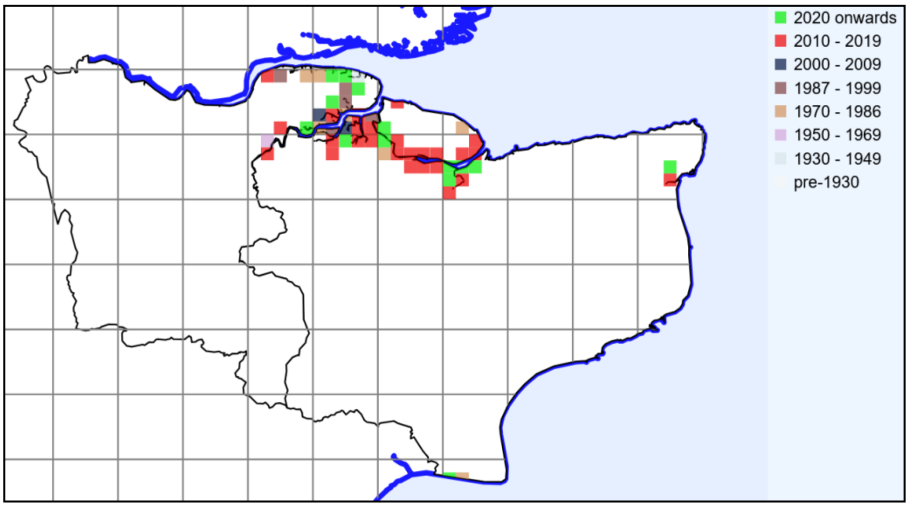
[740] (ed.) Lankester, E. (1848), *The correspondence of John Ray*. The Ray Society, London.

It was also given as growing abundantly in the Isle of Grain by Dillenius in the third edition of Ray's *Synopsis Methodica Stirpium Britannicarum* (1724). Hanbury & Marshall (1899) gave additional records for other locations: Whitstable, Pegwell Bay, Deal and New Romney, considering it to be locally plentiful on muddy shores. Francis Rose, in his manuscript *Flora of Kent*, treated it as a plant on firm consolidated mud in the general salt marsh community; sometimes on more sandy mud; not extending up estuaries far away from the zone of highest salinity; and no longer to be found on the S. Kent coast. He mapped it as present in eight hectads.



Map by Francis Rose: *Sarcocornia perennis* distribution, 1945-56.

This is the same total as given in Philp (1982) for 1970-81, although the latter omits Pegwell Bay, but includes a Dungeness sighting. The eight 1970-81 hectads were represented by 39 tetrad records. These had become 32 tetrads by the 1991-2005 survey published in Philp (2005), suggesting an 18% decrease. This is not borne out by our 2010-24 records, which cover cover 40 tetrads (65 monads). The fundamental distribution remains the same, clustered around the Swale and Medway estuaries and the neighbouring Thames estuary, with an outlier at Pegwell Bay. The species can readily be overlooked, especially in large areas of saltmarsh with varying accessibility as a result of interruption by deep, sinuous channels, and where it may be concealed by other vegetation.



Sarcocornia perennis* Kent records to 2024 mapped at tetrad level, from BSBI database

The norm in Kent is for it to be found, as mentioned in Philp (2010), in the middle and upper parts of salt-marshes. This is often in muddy areas dominated by *Atriplex portulacoides* (Sea-purslane), but we have also seen it at a saltmarsh margin with sand (Rainham), and on flat mud of channels and pools, not intermixed with other species (Kemsley Marshes). It has been claimed for ditches near Sheerness, which is unusual, and Kent records include at tidal creeksides and around saltmarsh pools, which tend to be in the upper saltmarsh. This versatility is also indicated by Leach (1994)[741], who refers to presence in both eroding lower parts of saltmarshes and in higher levels along drift-lines and on shell- and shingle-banks, including occasionally bare ground above the drift-line, such as trackways behind sea walls. While we have noted Kent habitats as frequently muddy, the species is considered intolerant in relation to a waterlogged substrate (Davy, A.J. et al., 2006[742], despite its regular inundation, and so underlying sediments may be expected to be relatively well-drained. We have not kept records of associated species, but have recorded, as present in the same saltmarsh, species such as *Puccinellia maritima* (Common Saltmarsh-grass), *Suaeda maritima* (Annual Sea-blite), *Atriplex portulacoides*, *Salicornia* spp.*, Limonium vulgare* (Common Sea-lavender), *Tripolium pannonicum* (*Aster tripolium*, Sea Aster) and *Spartina anglica* (Common Cord-grass). All these are mentioned by Davy, A.J. et al. (2006) as most frequently associated with *S. perennis* in English saltmarshes, in this order of frequency.

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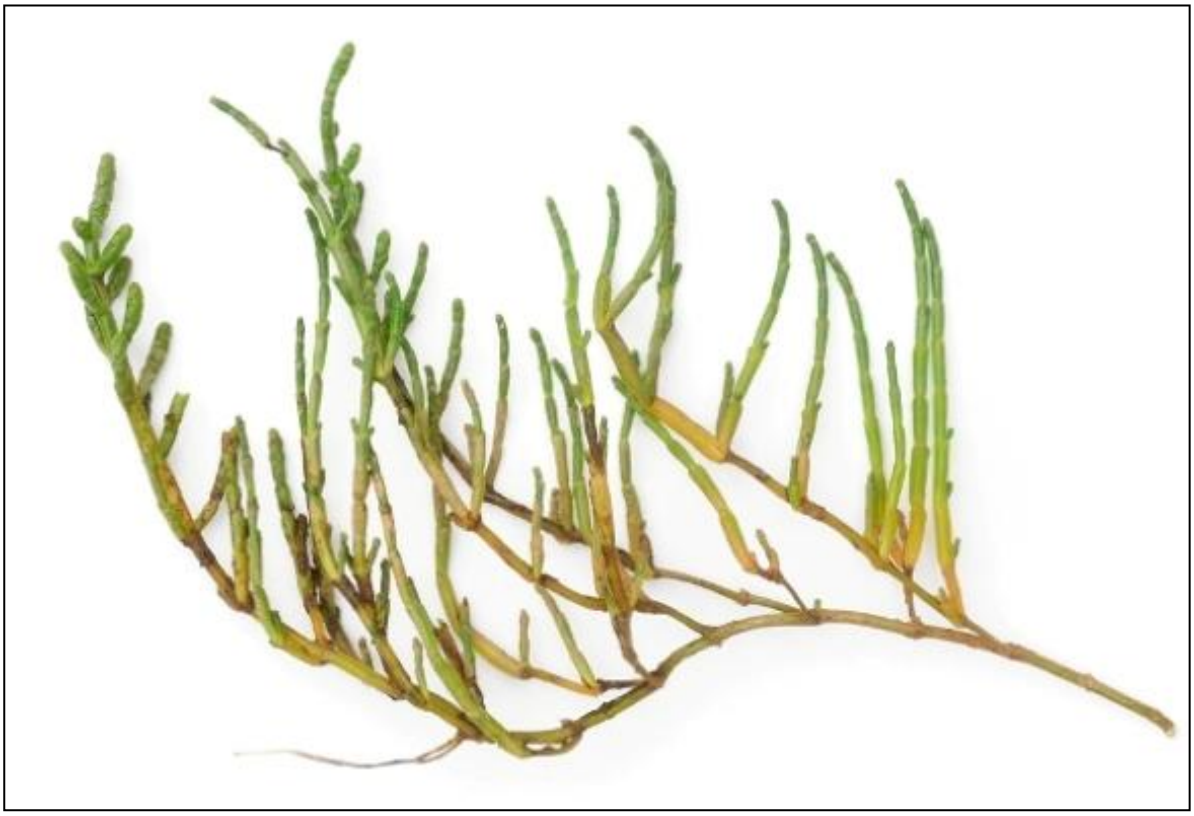
[741] Leach, S.J. (1994), in (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

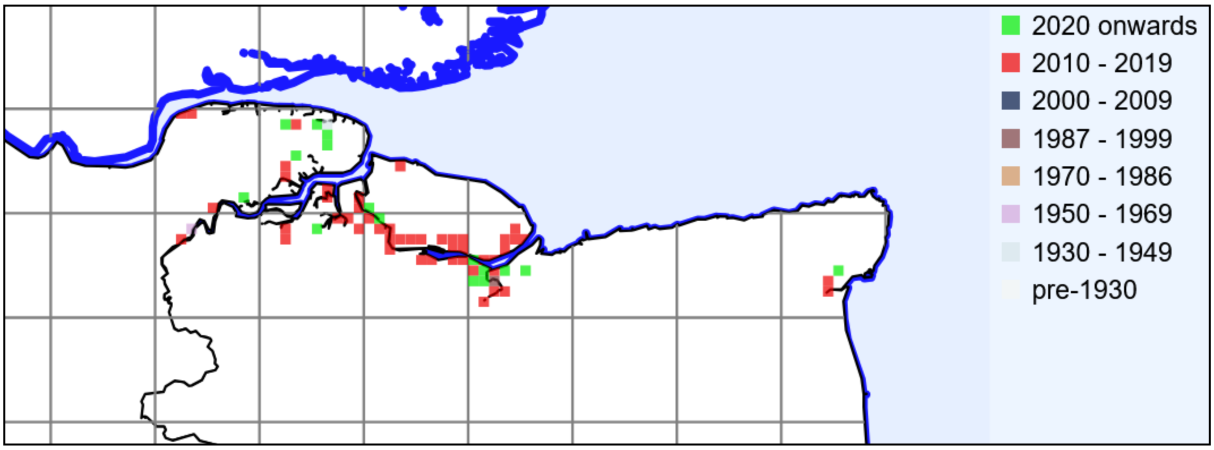
[742] Davy, A.J. et al., (2006). Biological Flora of the British Isles: *Sarcocornia perennis* (Miller) A.J. Scott. *Journal of Ecology* **94**: 1035-1048



Oare. Photo by Lliam Rooney, 26 September 20150

It is readily distinguishable from *Salicornia* spp. by its perennial character, and so is difficult to pull up. The woody stems are often procumbent, rooting at the nodes, and Leach (1994) refers to 'bushes' up to 1 metre across. The triads of flowers (cymes) are distinctive in that all three, ranging alongside above the base of a fertile segment, are almost of equal height. Not all stems bear fertile spikes and they are usually little-branched, developing from green to yellow-, orange- or reddish-brown.

Sarcocornia perennis **Kent records to 2024 mapped at monad level, from BSBI database**

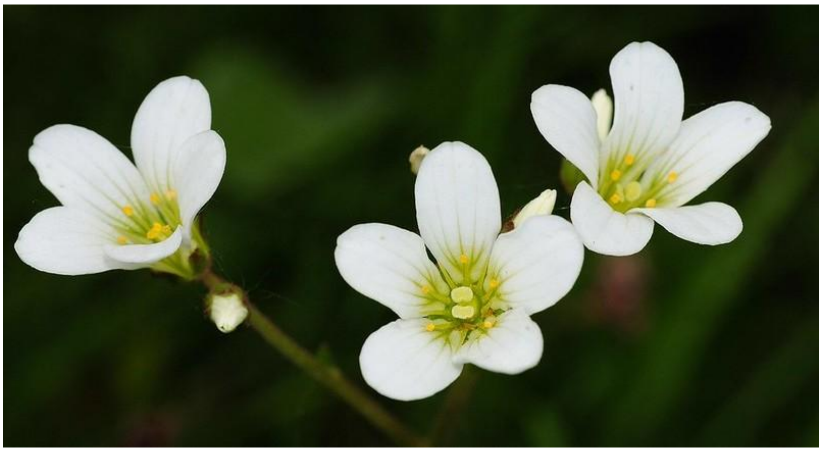


Saxifraga granulata L. (Meadow Saxifrage)

vc 15 (although not seen recently) and 16

Rarity / scarcity status

Saxifraga granulata is a perennial of damp but well-drained ground, locally common through much of Britain, although decreasing towards the west. Its conservation risk status in both England and Great Britain as a whole is one of 'Least Concern'. It is neither rare nor scarce in Kent, but was included in this register on the basis of substantial loss (e.g. through land improvement or development). However, from recent recording the extent of loss is not quite as great as is envisaged and the species is being retained on the register for continued assessment. It is a Kent axiophyte, and so is an indicator of good quality habitat.



Platt. Photo by Lliam Rooney, 13 May 2012

Account

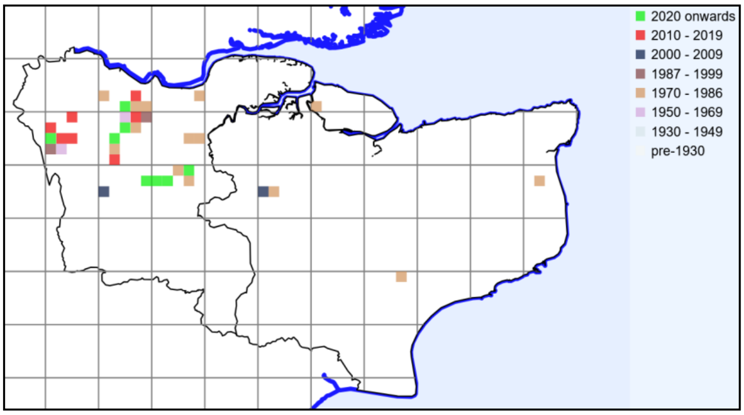
First publication of its Kentish presence was by Edward Jacob in his *Plantae Favershamienses* (1777): '*Upon* Beacon Hill – *uncommon*' (this is a hill to the west of Faversham, the geology of the top being Lambeth Group sands). However, *Saxifraga granulata* is more of a West Kent plant, and subsequent historic records reflect this. Hanbury & Marshall (1899) described it as locally plentiful in hedgebanks, heaths and moist meadows giving many records in north west Kent, such as at West Wickham, Hayes, Chislehurst, between Orpington and Farnborough, Halstead Place, Chelsfield, Greenstreet Green, meadows above and below Darenth, and wood-borders about Shoreham. Another cluster was from Bessel's Green through Seal and Ightham to Borough Green, which might be regarded as continuing on similar geology at Ryarsh and Bearsted. These and other records prompted a very full analysis by Francis Rose in his manuscript *Flora of Kent*:

> 'Dry grasslands, hedgebanks, and old pits on sandy or gravelly, not markedly acid soils; drier parts of alluvial meadows on valley gravels; only locally common; woods on (?Pliocene) sandy loams on the chalk plateau of the North Downs, rare. This species has a very peculiar distribution in Kent. It is, or was, common on the Tertiary and river terrace sands and gravels near London and down the Thames and extends up the gravels of the Darent Valley meadows to the Folkestone Sand E. (but not W.) of Sevenoaks, and extends intermittently along the Folkestones [*sic* for Folkestone Sands] as far E. as Hollingbourne. On the plateau of the North Downs it is found E. and W. of the Darent Valley and NW of the Medway occasionally; at one place between the Medway and the Stour; and in two places east of the Stour. It is unknown elsewhere in Kent, being absent from the Stour Valley; from the Greensand east of Hollingbourne; and from the Hastings Sands…. Its habitats have in common that they are all on free draining soils, and of neutral or very weakly acid reaction: both v[ery] calcareous and very acid soils are avoided. The pattern of distribution in Kent suggests relatively recent spread from the Thames valley up the Darent to the L[owe]r Greensand, possibly largely by vegetative means after forest clearance: long range dispersal of some kind may account for the very isolated colonies on the Downs plateau of mid and E. Kent.'

To this perceptive account, probably drafted in the late 1950s, Francis Rose added a large collection of records and it is striking how much these have since diminished. By the time of the 1971-80 survey (Philp, 1982) presence had reduced to 22 tetrads, mostly in TQ56 and TQ57 (north west Kent) and from Ightham to Ryarsh, on roadsides, railway banks, sandy meadows and waste places. There was a further, and very substantial, reduction in the 1991-2005 survey (Philp, 2010), down to six tetrads, with the plant apparently lost from several sites due to land use changes.

Platt churchyard. Photo by Lliam Rooney, 13 May 2012

Our 2010-24 records, however, give 15 tetrads (20 monads): five of these are from metropolitan West Kent which was not covered by the Kent surveys, leaving ten tetrads from the administrative county of Kent. The decline from 1971-80 is therefore not quite as great as had appeared, but remains substantial. The 1991-2005 records show the last occasion on which *Saxifraga granulata* was recorded in East Kent, in TQ85C, which comprises east Bearsted and Milgate Park.



***Saxifraga granulata* Kent records to 2024 mapped at tetrad level, from BSBI database.**

As well as including metropolitan West Kent sites, the accompanying map shows a series of records on gravelly alluvial soils along the Darent Valley, missed in the 1991-2005 survey, although known in many locations there before. Our recent records also refer to occurrences in sandy grassland, especially by roads, and there are numerous records for churchyards: Hayes, Chislehurst, Shoreham, Farningham, Horton Kirby, Ightham, Borough Green, Platt. Churchyards are especially likely to have kept unimproved grassland maintained as a short sward, suitable for the survival of *Saxifraga granulata*, but it may also be introduced in such locations; introduction may well be the case for the disused Darenth Park Hospital cemetery, for example, and will certainly be for a *flore pleno* form at St Mary's Riverhead.

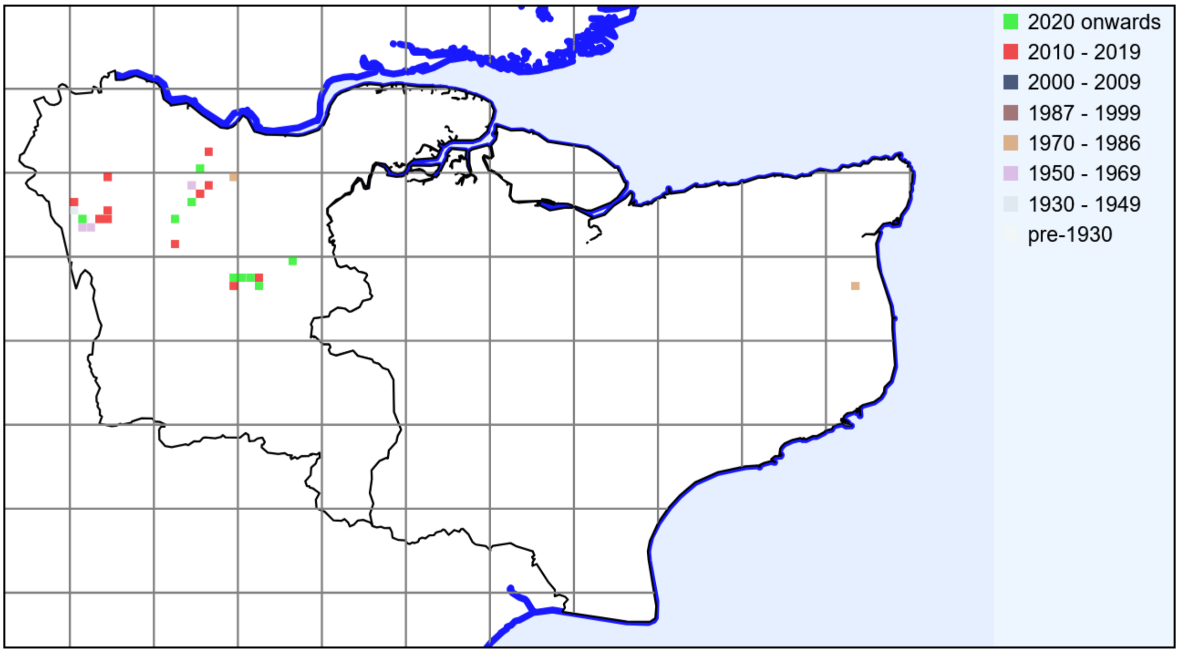
Borough Green Baptist churchyard, with flowering *Carex caryophyllea* (Spring Sedge). Photo by Geoffrey Kitchener, 3 May 2023

Meadow Saxifrage can easily be overlooked when only in leaf. When in flower it is conspicuous, but it can get mown down in roadside locations, such as the A25 roundabout between Ightham and Borough Green. This is not necessarily disadvantageous for reproduction as seed set in British gynodioecious populations and seedling survival is in both cases apparently low, and spread is more likely by means of axillary bulbils[743]. These form in the axil of each basal leaf, globular structures 3-5mm in diameter, which are capable of detachment and dispersal, forming a new rosette in autumn and over-wintering. The rosette is low and delicate-looking, and the plant is likely to be out-competed if its sward is not kept low.

It is unlikely to be confused with any other British lowland plant, although in churchyard situations one should be mindful that *Saxifraga hypnoides* (Mossy Saxifrage), also with white flowers, may be planted – that species has moss-like mats of leaves with linear lobes, quite distinct from the rounded gently lobed leaves of *Saxifraga granulata*.

Lullingstone Castle. Photo by Geoffrey Kitchener, 11 May 2024

***Saxifraga granulata* Kent records to 2024 mapped at monad level, from BSBI database.**



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[743] Stroh, P. (2019). Saxifraga granulata *Meadow Saxifrage*, in Stroh, P. *et al., Grassland plants of the British and Irish lowlands*, Botanical Society of Britain and Ireland, Durham.

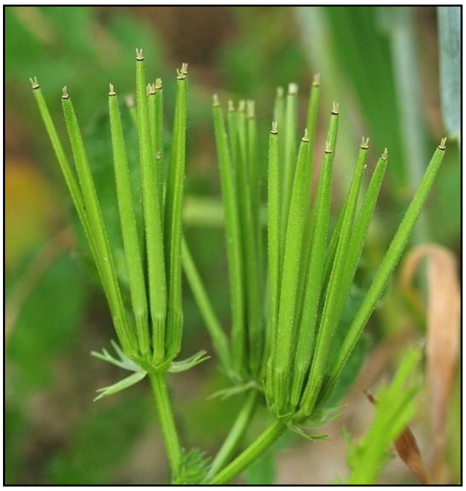
Scandix pecten-veneris L. (Shepherd's-needle)

vc 16

Rarity / scarcity status

Scandix pecten-veneris is an archaeophyte (or ancient introduction) which, with some other arable weeds, was formerly abundant in the British Isles and has since undergone major decline. It is now not common, found mostly in central and southern England, especially East Anglia, and is treated as **Critically Endangered** in Great Britain as a whole, **Endangered** in England. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. From the data in Philp (2010) it could be considered as rare in Kent, but it is better regarded as **scarce**. It is a Kent axiophyte, and so is an indicator of good quality habitat.

Haysden. Photo by Lliam Rooney, 12 May 2011



Account

The first published Kent record is by Thomas Johnson (*Iter Plantarum*, 1629}, found on the way between Gravesend and Rochester. There is archaeological evidence for earlier presence: seed has been found from early Roman ditch fill at Thurnham[744]; from an 8th/9th century context in a ditch at Lyminge[745]; from Anglo-Saxon deposits at Cliffs End[746]; and possibly (as the seed may have been *Chaerophyllum* or *Scandix*) from an early Romano-British context in a pit at Springhead[747]. Hanbury & Marshall (1899) do not list any other records after the first, as it was ubiquitous through the county, in fields and cultivated ground, especially on chalk and clay. Other local Floras do not add much to this: '*In Fields among Corn – very common*' (Edward Jacob, *Plantae Favershamienses*, 1777); 'In cornfields, very common' (Thomas Forster, *Flora Tonbrigensis*, 1816). Perhaps more flavour is given by Anne Pratt, not writing specifically about Kent, but much of her life was spent in the county: 'A common and troublesome weed is this plant, for it is found in almost every cornfield, from May to September, and in some fields seems almost as abundant as the corn itself' (*The Flowering Plants and Ferns of Great Britain*, 1855-66).

Haysden. Photo by Sue Buckingham, 17 May 2010

Changing agricultural practices in the twentieth century, especially herbicide use from the 1950s, transformed ubiquity into scarcity. Francis Rose, writing probably in the late 1950s, possibly 1960, was able to say that it was then not very common, but well distributed on arable land and waste open ground, especially on sand and chalk. He gave 1940s/50s records from Old Swanley (in fields); Cuxton (railway bank); east of Seasalter Church (cornfields); Graveney (farm weed); Hacklinge (field); south of Sandwich (field);west of Shoreham (cornfields); east of Westerham Hill (cornfield); Leaves Green (arable); Coombe Vale, Dover; Bishopsbourne; Bossingham; east of Dover; west of Penshurst (field by R. Eden); Platt; south west of Pembury (sandy arable land). This is the last snapshot of a relatively wide distribution of Shepherd's-needle, dwindling fast. By the time of the 1971-80 county survey (Philp, 1982), it was 'Rare and decreasing', only found in seven tetrads. This total reduced to three (Longfield, Marden and Dungeness) in the 1991-2005 survey (Philp, 2010), but was restored to eight tetrads (ten monads) by our 2010-24 records. One of these, south of Barnes Street, is threatened by extension of gravel extraction (2022).

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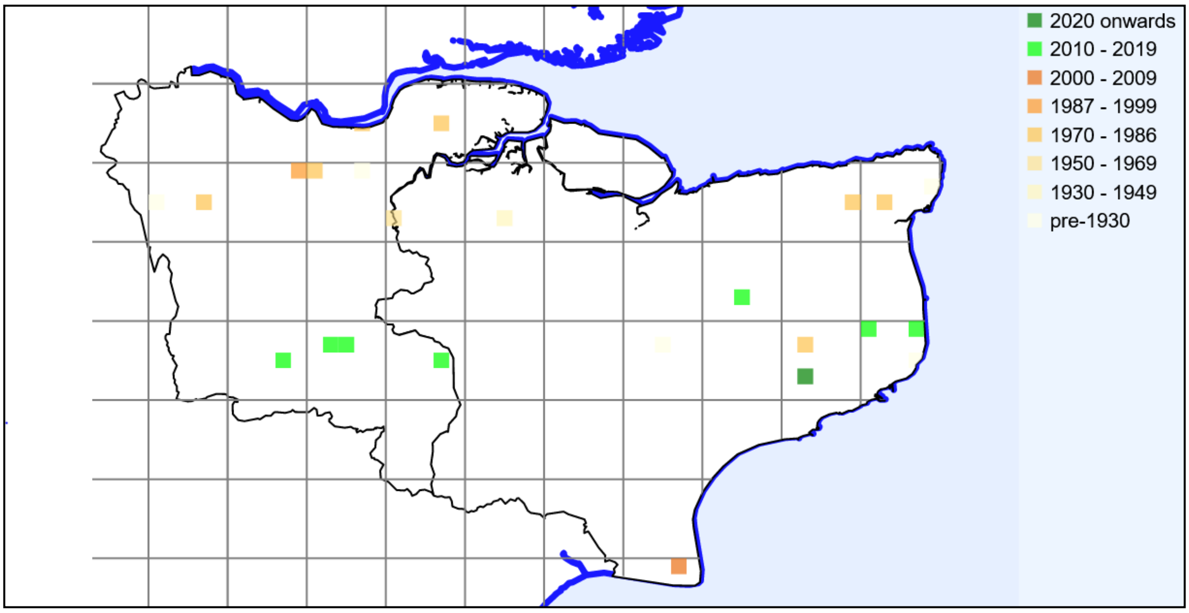
[744] Smith, W. & Davis, A. (2006). *The charred plant remains from Thurnham Roman Villa, Kent (ARC THM 98).* CTRL Specialist Report. London and Continental Railways.

[745] Campbell, G. (2012). Assessment of charred and mineral-replaced macroscopic plant remains from excavation at Lyminge, Kent 2008-10 (University of Reading), https://www.reading.ac.uk/web/files/archaeology/Campbell2012-palaeobotanical_assessment.pdf

[746] McKinley, J.I. *et al.* (2014) *Cliffs End Farm, Isle of Thanet, Kent. A mortuary and ritual site of the BronzeAge, Iron Age and Anglo-Saxon Period with evidence for long-distance maritime mobility*. Wessex Archaeology Report 31.

[747] Barnett, C. et al., Settling the Ebbsfleet Valley: High Speed 1 Excavations at Springhead and Northfleet, Kent. The Late Iron Age, Roman, Saxon and Mediaeval Landscape, vol.3 (Late Iron Age to Roman Human Remains and Environmental Reports (Charred plant remains from Springhead Sanctuary). https://owarch.co.uk/hs1/springhead-northfleet/pdf/springhead-volume-3-tables.pdf

***Scandix pecten-veneris* Kent records to 2024 mapped at tetrad level, from BSBI database.**



This mapping is extracted from the BSBI database to show the full extent of records after the mid-twentieth century decline had taken effect. It includes records from Philp (1982) and Philp (2010), the latter of which did not have a map, but it does not include records tabulated in this register below which are absent from the database. The 1970-86 records are well scattered, mostly on chalk, and only two represent locations where Shepherd's-needle has continued to be found: Marden and Ashley. There have, however, been some interesting discoveries of the species in the upper Medway valley, by arable both east and west of Tonbridge on alluvial soils.

Haysden. Photo by Lliam Rooney, 12 May 2011

Scandix pecten-veneris [748] grows as an annual especially with winter-sown crops, but pre-sowing cultivation of the ground is likely to be detrimental to its main germination, which takes place from October to late November, with a smaller flush of seedlings in spring. Seed dormancy appears low and seed longevity in the soil is five years maximum, so there is limited ability to survive periods of unfavourable cultivation patterns. It is this vulnerability, together with the effect of continued herbicidal treatment of crop margins in exhausting the seed-bank, which has brought about the scarcity of the species. The fruit or ‘needle’ of Shepherd’s-needle can reach up to 6cm and consists of two seeds with appendages which remain joined together until ripe, when the appendage acts as a spring dispersal mechanism. Held up in groups from each umbel (hence the ‘comb’ of *pecten-veneris*, Venus’ comb), these fruits yield some 50-150 seeds per plant.

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[748] Much of the following information is derived from (1) Smith, A. (1999) *Scandix pecten-veneris* L. Shepherd's-needle, In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough. (2) Liopa-Tsakalidi,A. (2014). *Scandix pecten-veneris* L.: A wild green leafy vegetable. *Australian Journal of Crop Science* **8(1):** 103-108.

It is a very distinctive plant in fruit; before that stage it might perhaps be taken for young *Coriandrum sativum* (Coriander) which, however, is glabrous and foetid.

Haysden, habitat. Photo by Sue Buckingham, 17 May 2010

Site	Grid reference	Site status	Last record date	Recorder	Comments
Green Street Green / Orpington (metropolitan vc16)	TQ4664		2 May 2004	JoA	TQ 462 645, three plants on chalky lawn edge of garden in Glentrammon Road.
Chelsfield (metropolitan vc16)	TQ4764		1971	JD	TQ 470[7] 642[5], field near station.
Shoreham, Sepham Farm	TQ56A		(1) 1990 (2) 1989	(1) JP (2) GJ	(1) Sepham Farm, 50 or more. (2) One plant at edge of pick your own strawberries field.
Shoreham	TQ5262		10 June 2002	JP	TQ 528 622, arable below downland, two large plants.
Mabledon / Haysden, Tonbridge	TQ5744		17 May 2010	SB	Fishponds Farm, S W Tonbridge. TQ 57141 44944, TQ 57321 44984. ± all around sprayed southern edge of wheat field. Plants tolerant of field edge spray but weaker.
Haysden	TQ5745		(1) 7 March 2019 (2) 17 May 2010	(1) DC (2) SB	(1) TQ 57037 45001, hundreds of young plants coming up around field margin. (2) Fishponds Farm, taking part in Countryside Stewardship Scheme. TQ 57036 45006, TQ 57024 45142, TQ 57390 45057. Prolific ± all around edge of wheat field. Highest density of plants in a 250m x 5m unsprayed stretch amongst the crop on western field margin alongside public footpath as at 1st

					grid reference (Other references indicate 2 northern field corners).
Dean Bottom	TQ56Z (includes TQ5868)		(1) 20 September 1995 (2) 1991-99	(1) JP (2) EGP	(1) TQ 589 685, 30 plants in flower and fruit. (2) TQ56Z.
East Tonbridge	TQ6357		12 June 2014	KBRG meeting	Margin of arable field from TQ 63276 47037 for about 7 metres eastwards.
East Tonbridge	TQ6447		(1)12 June 2014 (2) 12 May 2012	(1) KBRG meeting (2) DCa	[Site subject to minerals extraction application, January 2020] (1) (a) At margin of arable field and well into the crop at TQ 6422 4707 and for some distance east and west. (b) Several plants at margin of arable field at TQ 641 470. (2) Initially recorded as TQ 64219 47078, a few plants on footpath edge leading into arable field on heavy clay, just north of the westernmost of Whetsted gravel pits, covering 1 or 2 sq metres. May be longer term threat of extension of gravel extraction (site 71 in county minerals extraction plan). Later in May, reassessed by recorder as quite a few hundred individual plants, the vast majority of which are in a narrow strip between the headland and the current barley crop, within about 0.5m of the edge of the crop. The strip of plants stretches along about 150m along one edge of one section of the crop from west to east from about TQ 64148 47063 to TQ 64296 47084.
Longfield	TQ66E		After 1970, before 1981	JRP, EGP (Philp, 1982	TQ66E.
East Gravesend	TQ67S		After 1970, before 1981	Philp (1982	TQ67S
Marden	TQ74S (includes TQ7644)		(1) 11 May 2019 (2) 5 May 2019 (3) 28 May 2010 (4) 16 May 2010 (5) 9 May 2009 (6) 26 May 2003 (7) 1991-99 (8) 24 July 1986 (9) After 1970,before 1981	(1) SL (2) DC (3) SP (4) SB (5) DM (6) JP (7) EGP (8) RoF, AS (9) Philp (1982)	(1) South of Marden Meadow KWT Reserve, TQ 64504 4454. Recently harrowed arable field, northern border along the southern side of Marden Road. A few patches together in flower and seeding. (2) TQ 76421 44444. About 20 flowering plants with Field Pepperwort at the margin of arable field where it meets hedge. (3) TQ 76425 44460, field opposite Marden Meadow Reserve, many plants all along edge of Rape field nearest the road. (4) TQ 76393 44466. (5) TQ 746 445. (6) TQ 763 444, some in fruit, others in flower, also young plants seen along the headland area, northern edge of arable. (7) TQ74S. (8) TQ 761 444. (9) TQ74S. [This is a selection of records.]
Cooling / High Halstow	TQ77S		After 1970,before 1981	Philp (1982)	TQ77S.
Dungeness	TR01U (includes TR0619)		(1) 18 May 2000 (2) 18 May 2000	(1) EGP (2) MGT, BCE	(1) TR01U. (2) TR0619, old ARC works.
Lower Hardres	TR1453		18 May 2011	JA	TR 14385 53564, one patch of c. 10

					plants at edge of wheatfield, and another plant about a foot away.
Swingfield Minnis	TR2342		(1) 4 April 2023 (2) 14 March 2020	(1) SC (2) SC, ML	(1) Patch persists - 2m along arable verge TR 2352 4202. (2) (a) 5 metre patch on road edge, TR 2352 4202. (b) TR 23520 42028, on clay-with-flints, a large patch c.5 x 0.5m along a roadside where the field had been ploughed to the road edge, plenty of flowers, and a single plant a few metres away had mature and immature seedcases, including some that had already opened early in the year.
Wootton	TR24I		After 1970,before 1981	Philp (1982)	TR24I.
Monkton	TR26X		After 1970,before 1981	Philp (1982)	TR26X.
Ashley	TR34U (includes TR3048, TR3148)		(1) 27 May 2019 (2) 6 May 2017 (3) 12 June 2016 (4) 3 May 2011 (5) After 1970,before 1981	(1) DC (2) SC (3) SC (4) GH (5) Philp (1982)	(1) TR 31119 48360, one in flower on east side of path, several unhealthy-looking seedlings on the west side. (2) 50 plants alongside a barley field TR312 484 (3) TR 3103 4844, In rape edge for 70 yards. (4) Plentiful along about 2m of edge of arable by North Downs Way between Ashley and Roman road. (5 TR34U.
Deal	TR3649		(1) 15 July 1987 (2) 22 July 1986	(1) RoF, PJW (2) RoF, AS	(1) TR 365 495, between Coldblow Farm and Kings Farm. (2) TR 365 495, A258 south of Deal.
Cliffs End	TR36H		After 1970,before 1981	Philp (1982)	TR36H.

Schoenoplectus tabernaemontani (C.C. Gmel.) Palla x *triqueter* (L.) Palla (*Schoenoplectus* x *kuekenthalianus* (Junge) D.H. Kent) (Hybrid Club-rush)

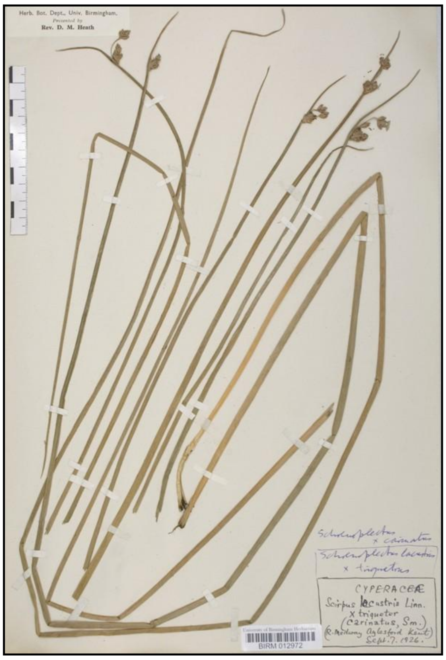
vc 15; gone from vc16

Rarity / scarcity status

Schoenoplectus x *kuekenthalianus* is included in this register in substitution for *Schoenoplectus triqueter* (Triangular Club-rush) which was formerly a Kent plant but now appears extinct, so its genes continue only in the hybrid. *Schoenoplectus triqueter* itself is **Critically Endangered** in England and in Great Britain as a whole, and is thought to survive in Great Britain only as introduced plants, with all native plants lost; the other parent, *Schoenoplectus tabernaemontani* (Grey Club-rush) is not uncommon, and its conservation risk status is one of 'Least Concern'. The hybrid has no conservation risk assessment for England independent of its parents, but in Great Britain it is treated as **Vulnerable** to the risk of extinction. The hybrid grows by all the British rivers from which *Schoenoplectus triqueter* has been recorded: the Tamar, Arun, Thames and Medway. It is very **rare** in Kent and is seldom recorded, because it is inaccessible safely except by boat.

Account:

The *S. triqueter* parent was long known in Kent, being first mentioned by John Ray (*Catalogus Plantarum Angliae*, 1670) as reported to him from *'By the RiverThames-side, both above and below London'*. Although seen by Daniel Cooper (*Flora Metropolitana*, 1836) between Greenwich and Woolwich, it was extinct in Kent alongside the Thames by the end of the century (Hanbury & Marshall, 1899). The first reference to it growing by the Medway appears to be by Hanbury & Marshall (1899), where it is said to have been found by A.H. Wolley Dod in 1894 as plentiful on the right bank of the Medway, between Aylesford and Forstal (i.e. on the vc15 East Kent side). Marshall also added a note that it occurred also on the left bank, both above and below Aylesford Bridge.


Herb. Bot. Dept., Univ. Birmingham.
Presented by
Rev. D. M. Heath
Schoenoplectus x carinatus
Schoenoplectus lacustris x triquetrus
CYPERACEÆ
Scirpus lacustris Linn. x triqueter (carinatus, Sm.)
(R. Medway Aylesford Kent)
Sept. 7. 1926.
BIRM 012972

Schoenoplectus x *kuekenthalianus* (Hybrid Club-rush), mislabelled as to identity. Aylesford, 1926, herbarium of Birmingham University.

The position is complicated by Marshall also having recorded as a species along the right bank of the Medway above Aylesford what was then called *Scirpus carinatus*, albeit noting in Hanbury & Marshall (1899) that there were views that *Scirpus carinatus* was really a hybrid between species which are now called *Schoenoplectus lacustris* (Common Club-rush) and *Schoenoplectus triqueter* (this has since become accepted, and the hybrid is *Schoenoplectus* x *carinatus*). However, Marshall separately commented that his *Scirpus carinatus* was 'probably a hybrid between *S. Tabernaemontani* and *S. triqueter*, with which it seems to be usually, if not always, associated'[749]. He did not follow this up in the 1899 Flora and should have stayed with his instincts, for this is probably the first Kent record for *Schoenoplectus* x *kuekenthalianus.*

This hybrid did not appear to be then recognized in the British Isles, and botanists long persisted in recording *S. carinatus* (*S.* x *carinatus*) instead. For example, this applies to a record by T.J. Foggitt in 1927 from the River Medway at Aylesford (vc15) and, indeed, all Medway *S. carinatus* (*S.* x *carinatus*) was probably recorded in error, the putative parent *Schoenoplectus lacustris* not being present by the river.

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[749] Marshall, E.S. (1895). Notes on Kentish plants observed during 1894. *Journal of Botany* **33:** 164-165.

The last record for *S. triqueter* by the Medway appears to have been by N.D. Simpson in 1938[750], and it is thought to have disappeared after the river walls were constructed and a new cut straightened the river, although some plants may have survived for a while along by the Friary. The hybrid, *Schoenoplectus* x *kuekenthalianus*, continued and there were, for example, sightings by R.A. Boniface in 1950 at Aylesford, and by Eric Philp, who stated (Philp, 1982) that there was one patch of about eight plants along the edge of the River Medway near New Hythe (TQ 715 600).

In August 1987, an attempt was made to ascertain what the position was generally as regards the presence of the hybrid and possible survival of *S. triqueter*.[751] Eric Philp, as Honorary Swan Master for Maidstone Borough Council, and involved in the annual swan upping or census on the river, had contacts including the owner of a cabin cruiser who was prepared to take Eric, together with Rosemary FitzGerald and Jim Bevan along the Medway. A rubber dinghy was also brought, so it was possible to leave the cruiser to approach and examine each clump, collecting specimens from most. The expedition followed the tide upstream, and many clumps of *S. tabernaemontani* were seen on the mud at the outer edge of stands of *Phragmites australis* (Common Reed). Then, two partly inundated clumps of a noticeably different nature were encountered when the bends between Snodland Common and Burham Marshes were reached, at TQ 713 614 and TQ715 614 (east bank, vc15). These were shorter and more slender, darker green, barely coming into flower and of a rather floppy habit quite different from the stiff clumps of *S. tabernaemontani.* The colour, small size and late flowering were all characteristic of *S. triqueter*, but the stems, although three-angled, were somewhat smooth-angled rather than sharply defined. The glumes, which in *S. tabernaemontani* have obvious red papillae, seemed to show slight papillae in some cases; and although the flowers were immature, they should not in the case of *S. triqueter* have shown any such indication. The known clump of *Schoenoplectus* x *kuekenthalianus* at TQ 715 600 was also examined, but further search was constrained by the need to reach Allington lock before the tide turned down. The find of the two clumps was initially publicised as *S. triqueter*, at the BSBI Annual Exhibition (1987) and in *BSBI News* (**49**:49). However, the contra-indications mentioned above, together with a re-examination of the clumps in 1996 by Eric Philp and Tim Rich resulted in the determination being withdrawn, and the two clumps were confirmed as *Schoenoplectus* x *kuekenthalianus.*[752]

Snodland/Burham, with Eric Philp. Photo by Rosemary FitzGerald, August 1987

The hybrid was sought in 2000, when putative material was collected from alongside the Medway at TQ 7132 6143 (vc15), but AFLP genetic fingerprinting showed that this was *S. tabernaemontani* after all.[753] By contrast, some material from non-Kent localities which resembled *S. tabernaemontani* turned out to be the hybrid instead. In August 2018 Richard Lansdown secured access by boat to obtain material from a putative hybrid plant forming part of a clump on the outer edge of a band of *Phragmites australis* (Common Reed) on the edge of deep, soft mud on the east bank of the Medway opposite Snodland (TQ 715 614) for comparison with samples analysed from other (non-Kent) sites. The material strongly resembled *S. tabernaemontani*, but with the shoot sub-triangular in cross-section immediately below the inflorescence.

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[750] Rich, T.C.G. & FitzGerald, R. (2002). Life cycle, ecology and distribution of *Schoenoplectus triqueter* (L.) Palla (Cyperaceae), Triangular Club-rush, in Britain and Ireland, *Watsonia* **24:** 57-67.

[751] Details from manuscript notes by Rosemary FitzGerald, 1987.

[752] Rich, T.C.G. & FitzGerald, R. (2002), as cited above.

[753] Fay, M.F., Cowan, R.S. & Simpson, D.A. (2003). Hybridisation between *Schoenoplectus tabernaemontani* and *S. triqueter* (Cyperaceae) in the British Isles. *Watsonia* **24**: 433-442.

The distinguishing characters of the hybrid include: glumes somewhat papillose; stems often glaucous; stigmas mostly two; inflorescence usually lacking secondary branching.[754]

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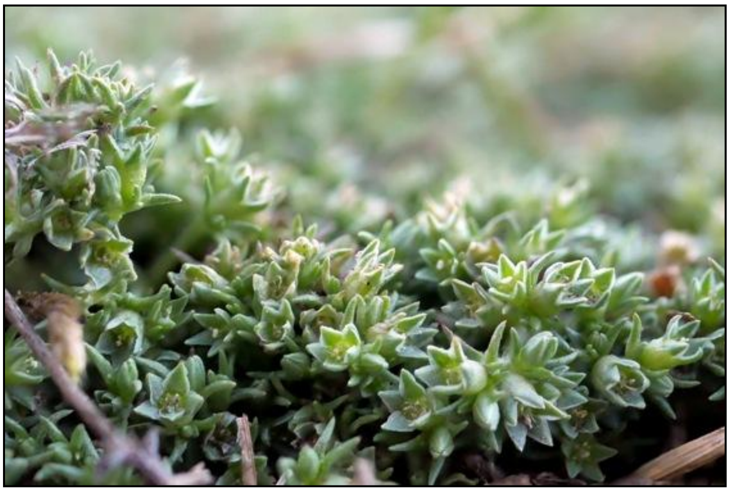
[754] Schoenoplectus (Rchb.) Palla. In (eds.) Stace, C.A., Preston, C.D. & Pearman, D.A. *Hybrid Flora of the British Isles*, Botanical Society of Britain and Ireland, Bristol.

Sceleranthus annuus L. (Annual Knawel)

vc 16

Rarity / scarcity status

Scleranthus annuus is widespread in open sandy ground across most of the British Isles, but absent from the far north and rare in Ireland. Despite the breadth of its range, it is regarded as **Endangered** in both England and Great Britain as a whole due to the severity of decline. In England, the extent of its occurrence, or geographical spread, was taken to have declined by 64% in comparing records for 1930-69 and 1987-99; and during this period the area of occupancy within the extent of its occurrence – this is a measure of the likelihood of encountering the plant – had declined by 67%. In Kent there is evidence of a decline of 80% between 1971-80 and 1991-2005, and the species is now **scarce**. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006 and is a Kent axiophyte, an indicator of good quality habitat.



Dartford Heath. Photo by David Steere, 14 May 2019

Account

The first Kent (and British) record for Annual Knawel appears to be Thomas Johnson's, but whether attributable to his 1629 or 1632 Kentish journey is debatable. If the former (given in his *Iter Plantarum*, 1629), then the plant was encountered between Gravesend and Rochester. This could have been when encountering sandy ground from the Thanet Formation near Shorne and Higham (a later find is recorded in Francis Rose's manuscript *Flora of Kent* as near Shorne windmill, some 500m from the Gravesend-Rochester road). If the latter (given in his *Descriptio Itineris*, 1632), then this was a find between his party's inn at Margate, and Quex at Birchington, probably before reaching Westgate Bay (there are no other localised records in this area and the geology does not suit, except for consolidated shingle, which is not a common habitat for the species).[755]

Hanbury & Marshall (1899) considered it to be a locally plentiful of heathy or sandy dry fields, with records across the county, including Edward Jacob in *Plantae Favershamienses* (1777) ('On barren dry sandy soils – very common') and Thomas Forster (*Flora Tonbrigensis*, 1816) ('In cornfields and barren places, very common'). That breadth of coverage was still evident from Francis Rose's records in his manuscript *Flora of Kent*. Plants ranged from (e.g.) the gravels of the north west Kent metropolitan commons, to cliff tops on

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[755] The 1629 record is of *Saxifraga Anglicana, Alsines minimum genus Daleschampii polygonum selinoides Gerardii*, and hence refers back to John Gerard. The plant so named by Gerard in his *Herball* (1597) was listed among the knot-grasses and called Parsley Piert as well as Knawell (a German vernacular name), but Johnson in his 1633 edition of the Herball pointed out that Gerard had muddled up his illustrations and descriptions here. It is likely as well that Johnson's views of correct nomenclature had been changing, not only after he wrote his 1629 journal, but also between his 1632 journal and the 1633 *Herball* publication, having received help from John Goodyer. Johnson in his *Descriptio* (1632) refers to *Polygonum selinoides* Ger. *sive* Knawel *Germanorum; an Vermiculata nova planta montana Col*?, i.e. he was naming it as Gerard's *Polygonum selinoides*, but querying whether it might instead have been a different plant named by Fabio Columna or Colonna. In the event, by 1633 he was thinking it might be neither of these.

These complications make it difficult to decide whether Johnson had seen the plant in 1629, 1632 or at all. W.A. Clarke (*First records of British flowering plants*, 1900) purported to follow Hanbury & Marshall (1899) in accepting the 1629 record as Knawel; but presumably forgot he had already given this as the first British record for *Sagina procumbens*. Francis Rose accepted both 1629 and 1632 records as being Knawel in his manuscript Flora of Kent (probably written in the 1950s or 1960s); but in the 1972 edition of Johnson's journeys in Kent, he treated the 1632 plant as probably Annual Knawel, but the 1629 plant as *Sagina* sp., either *Sagina apetala* or *Sagina procumbens*. David Pearman (*The Discovery of the Native Flora of Britain & Ireland*, 2017) accepts the 1632 record, but treats the 1629 one as *Sagina procumbens*.

There is no satisfactory answer to any of this. Likelihood of occurrence in the relevant spot would favour the 1629 record as valid.

Bagshot sand at Minster in Sheppey; a gravel pit near Littlebourne; sandy fields south of Darenth Wood; a chert pit at Fawke Common; a cornfield on Folkestone Sand near Chegworth; Hothfield Heath; the Toad Rock, Rusthall; and many arable fields. Much of that range persisted in the 1971-80 survey published in Philp (1982), when Annual Knawel was considered rather local on dry sandy or gravelly ground, particularly on heaths and sandy roadside verges; mapping showed 25 tetrads, including a number of sites tracking the sands of the Folkestone Formation which crosses the county.

However, the 1991-2005 survey (Philp, 2010) showed a drastic decline, to five tetrads (Farningham Wood, TQ56J; Dartford Heath, TQ57G; Addington, TQ65P; Lydd, TR02K; and St. Mary's Bay (Littlestone Warren), TR02Y). The decline was recognised as reflecting the national position, but without considering what might be the cause. Annual Knawel occurs in two distinct habitats: arable fields and dry, heathy grassland. [756] At least part of the decline since the 1950s relates to its arable habitats. Francis Rose's records from fields, where dated, all relate to the 1940s and 1950s, except for one in 1962. There have been no recent arable records at all. This may be another manifestation of the general decline in classic cornfield weeds, largely due to agricultural herbicide, although Walker *et al.* (2017)[757] found the greatest losses in England and Wales associated with a lack of disturbance and closed conditions on small farm tracks, an absence of uncropped field margins and conversion of fields to a sown grass ley. It is not clear whether any of the 25 tetrad records in Philp (1982) was from an arable context; but clearly they came in the main from heaths and sandy roadside verges. So it looks as though the 80% decline between then and the 1991-2005 survey (Philp, 2010) should have another explanation, whatever that may be.

Dartford Heath. Photo by David Steere, 14 May 2019

This last decline does not seem to have worsened, in that our 2010-24 records cover seven tetrads (eight monads), including all those in Philp (2010). This period included the BSBI's Threatened Plants survey, which involved an attempt to re-find historic sites, with only 35% success nationally. In Kent, the two selected sites for 2013 were at Addington (where the species was re-found) and Dartford Heath (where the species could only be relocated in an adjoining monad).

The Addington habitat was a disused quarry on the sands of the Folkestone Formation; such sites offer a greater probability of re-finding because of localised erosion opening up an early successional niche, and in this case the availability of open, mobile sand seemed to derive from falls from the quarry walls, and wind-blow through a gap in them. The population was on the dry sandy quarry floor, largely unvegetated, but with associated species including *Aira praecox (*Early Hair-grass), *Cerastium fontanum* (Common Mouse-ear) and *Rumex acetosella* (Sheep's Sorrel), all cited by Walker *et al.* (2017)as amongst most frequent associates generally. Also present were rare plant register species *Filago germanica* (Common Cudweed) and *Logfia mimina* (Small Cudweed).

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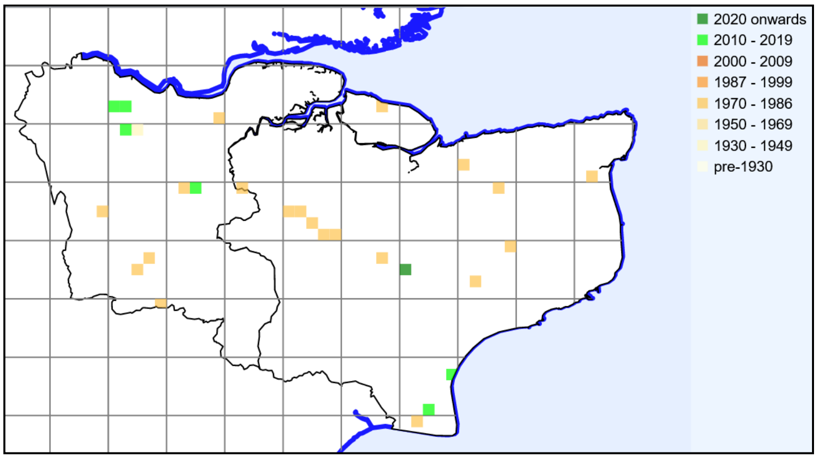
[756] Lockton, A.J. & Pearman, D.A. (accessed 3 November 2020). Species account: *Scleranthus annuus.* Botanical Society of Britain and Ireland, http://sppaccounts.bsbi.org/content/scleranthus-annuus-1.html

[757] Walker, K.J., Stroh, P.A. & Ellis, R.W. (2017). *Threatened Plants in Britain and Ireland*. Botanical Society of Britain and Ireland, Bristol.

The Dartford Heath site also reflected the suitability of old quarry workings, as the Annual Knawel was associated with the Glory Bumps, a series of ridges formed by soil removal for the extraction of brick-earth in the mid-nineteenth century. These may well still provide opportunities for erosion and abrasion producing open ground without being excessively trampled. The same generally frequent associates as at Addington were present, plus some interesting plants of sandy habitats: *Cerastium semidecandrum* (Little Mouse-ear), *Cerastium diffusum* (Sea Mouse-ear), *Logfia minima* (Small Cudweed) and *Spergularia rubra* (Sand Spurrey).



***Scleranthus annuus* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Other current Kent sites are not the product of mineral workings, but in their different ways reflect the needs of Annual Knawel for open, free-draining, highly infertile terrain: on sands of the Thanet Formation at Farningham; on sands of the Folkestone Formation at Ashford; and on old coastal sand and consolidated shingle ridges at Lydd and Littlestone Warren. These habitats provide open ground for seedling establishment and limited competition for a generally decumbent plant which, according to Francis Rose, behaves as an annual in arable habitats but can be biennial (which he equated with var. *hibernus*) in heathy habitats. A seedbank may persist under closed conditions, to be revived upon disturbance; Walker *et al.* (2017) cite a study of vole burrowing in the Pyrenees as enabling reappearance of the plants after many years, but although Annual Knawel seeds germinated abundantly from the burrow mounds, the length of persistence in the soil bank does not seem to have been investigated. By contrast, a study of abandoned fields in Finland[758] placed this species in a group of plants which disappeared within six years of abandonment, but a few seeds were found to germinate from soil samples taken 21 years after abandonment, so viability for at least 15 years was demonstrated.

Dartford Heath, habitat.
Photo by David Steere, 14 May 2019

There are two subspecies: *Scleranthus annuus* subsp. *annuus* with divergent sepals when ripe; and subsp. *polycarpos* with parallel or convergent sepals when ripe. The former subspecies is the usual Kent taxon. Subsp. *polycarpos* has been identified by Peter Sell from material gathered by Professor J.S. Henslow from West Kent in 1826. Sell also identified as this subspecies material gathered by St. John Marriott in 1933; this is presumably part of what the latter distributed through the Watson Botanical Exchange Club as var. *hibernus* from Dartford Heath[759]. In Sell & Murrell (2018), subsp. *polycarpos* is noted as the subspecies of sandy heaths, especially in East Anglia; subsp. *annuus* as of cultivated and waste ground, although intermediates are supposed to grow as populations, Annual Knawel being highly inbreeding. In Kent, we have not generally been recording to subspecies, although Eric Philp (Philp, 2010) mentioned that all plants examined had proved to be subsp. *annuus*.

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[758] Kiirikki, M. (1993) Seed bank and vegetation succession in abandoned fields in Karkali Nature reserve, southern Finland. *Annales Botanici Fennici* **39**: 139-152.

[759] The Watson Botanical Exchange Club Report for 1923-24: **3**(7) at p.258.

Site[760]	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Farningham Wood	TQ56J (including TQ5368)	SSSI, Local Nature Reserve	(1) 13 May 2011 (2) 20 May 1998 (3) 1991-99 (4) 1994 (5) 28 June 1982	(1) SB (2) JS (3) EGP (4) RMB (5) RMB	(1) 100 plants in 4 sq metres of sandy bank, TQ 53651 68506, in danger of scrubbing over [which is indeed what has happened since]. (2) TQ 540 684. (3) TQ56J (4) TQ 5363 6859, several small plants W of wood. (5) Rabbit-grazed slope at TQ 536 681, a few plants. Records for W border of wood go back at least to 1945 (FR).
Dartford Heath east	TQ5173	Dartford Borough Council owned & managed common	(1) 10 June 2011 (2) 16 May 2010 (3) 24 May 1986	(1) SB (2) GK (3) RMB	(1) Sandy heathland, TQ 51909 73246. (2) (a) TQ 51438 73247, frequent on semi-bare gravelly ground. (b) TQ 51949 73199, frequent for at least 10m of semi-bare gravelly bank on heath. (3) Abundant on clinker TQ518734.
Dartford Heath west	TQ57G (including TQ5273)	Dartford Borough Council owned & managed common	(1) 14 May 2019 (2) 12 July 2013 (3) 10 June 2016 (4) 27 April 1997 (5) 1991-99 (6) 24 May 1986 (7) 1974-5	(1) DS (2) GK (3) SB (4) JS (5) EGP (6) RMB (7) RMB	(1) Hundreds of plants, mainly on north side of path all across this area. From TQ 5202 7323 to TQ 5209 7330 and all point between. Further plants scattered about TQ 5215 7329. (2) TQ 52420 731766, about 30 plants on s-e facing pebbly/sandy mound slope, part eroded. TPP survey. (3) On Glory Mounds at TQ 52426 73160. (4) TQ 5213 7312. (5) TQ57G. (6) On gravel ridges, TQ5273. (7) TQ5273, abundant on ground disturbed by gravel digging.
Sevenoaks Wildlife Reserve	TQ5256	KWT managed reserve	5 July 1981	KFC	TQ523567, scarce on sandy path.
Between Nepicar and Addington	TQ65J		14 September 1978	EGP & JF	A few plants, survey of verges of M20 motorway.
Addington	TQ65P, includes TQ6459		(1) 13 July 2013 (2) 1991-2000	(1) GK (2) EGP	(1) Five plants at TQ 64889 59008, one at TQ 64924 59036 and one at TQ 64881 59018, all in mobile sand of disused quarry. TPP survey. (2) TQ65P.
Ashford Eureka Park	TR0044 and TR0045		(1) 21 June 2020 (2) 7 June 2018	(1) SC (2) SB	(1) (a) Three plants around TR 0078 4499. (b) A dozen plants around TR 0078 4500. (2) (a) Subsp. annuus, 100 or more plants on sandy grassland area at TR 0076 4497, Eureka park. Covering an area of some 3 x 3 metres with accompanying plants:

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[760] This table excludes 1971-1980 records from the 25 tetrads given in Philp (1982), viz. TQ45X, TQ53Z, TQ54M, TQ54T, TQ57B, TQ57G, TQ65J, TQ65P, TQ67V, TQ75J, TQ85C, TQ85H, TQ85L, TQ85Q, TQ85V, TQ94T, TQ97R, TR01J, TR02Y, TR04C, TR14G, TR14Z, TR15U, TR16B, TR36F.

					Aira caryophyllacea, Logfia minima, Ornithopus perpusillus etc. (b) Subsp. annuus, at least 50 plants at TR 0078 4501 on bare sand in dry grassland area, Eureka park. Accompanying species included *Aira caryophyllea, Logfia minima* and *Vulpia bromoides* and *V. ciliata*.
Lydd	TR02K, includes TR0521	SSSI	(1) 31 May 2013 (2) 14 May 2005 (3) 1991-99	(1) OL (2) RM (3) EGP	(1) In two places on Lydd Common (old sand/shingle ridges), at TR 05095 21853 and TR 05223 21906. (2) TR 0509 2180. (3) TR02K.
Littlestone Warren	TR02Y (including TR0826)	SSSI	(1) 23 May 2019 (2) 28 April 2014 (3) 5 June 2010 (4) 23 June 2007 (5) 28 May 2005 (6)1991-99	(1) DC (2) GK (3) KBRG meeting (4) BL (5) JP (6) EGP	(1) TR 08885 26695, in dunes. (2) TR 0889 2671, scattering of plants on sparsely vegetated flat or slightly undulating sandy ground. (3) Many plants scattered on sandy ground of The Warren in vicinity of TR 08887 26813. (4) TR08868 26798, abundant in area of grassland between sea wall and Littlestone Golf Course. (5) TR 088 262, widespread. (6) TR02Y.
Chequers Wood, Canterbury	TR15U		22 June 1981	FR	

Serapias vomeracea Burm. F. (Briq.) (Long-lipped Tongue-orchid)

vc 15

Rarity / scarcity status

Serapias vomeracea has a Mediterranean-Atlantic distribution and, setting aside a deliberate introduction in Somerset, has no record as a wild plant in the British Isles other than a single plant in East Kent, discovered in 2020. It has been designated (2023) as 'Native or Alien' (alien if arrival of the plant is taken to be of anthropogenic origin, via traffic movement) with a threat status of **Critically Endangered**.

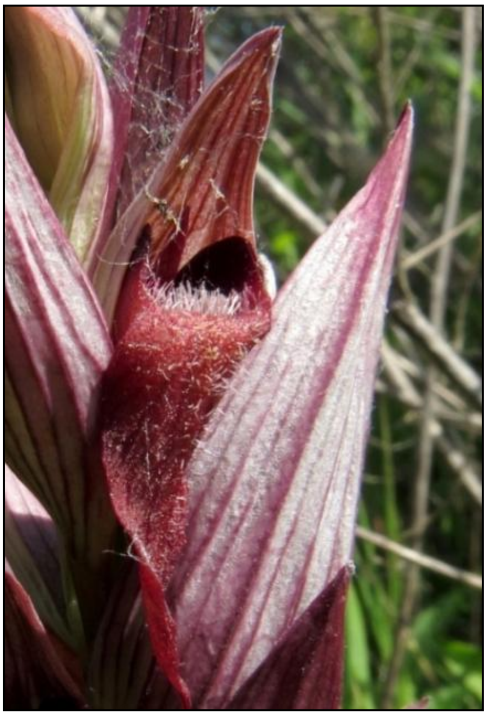

Photo by Daphne Mills, May 2020

Account

A fuller account of this plant is given in Kitchener *et al.* (2021)[761]. It was discovered on 23 May 2020 by Daphne Mills on motorway-related land in East Kent, the exact location of which is being maintained confidential[762], to reduce the risk of damage to the plant and its immediate habitat. The means of arrival of this plant in Kent cannot be known for certain, but its location is such that planting is highly unlikely. The species is cultivated, and can be acquired commercially in the British Isles, but cultivation in the general area is not known. There is potential for wind-blown seed to have arrived from the Continent, and Kent is favourably placed for this. However, there is another strong possibility as regards the relevant vector, and that is vehicle-assisted dispersal. Most traffic from the Continent comes through Kent. In 2019, 2 million cars, over 73,000 coaches and nearly 2.4 million road haulage vehicles passed through the port of Dover – presumably half of these were in-coming (similarly as regards Eurotunnel, whose 2019 figures are for more than 2.6 million passenger vehicles and almost 1.6 million road haulage vehicles). Potential for seed dispersal via Continental road traffic is evidenced by recent records for *Atriplex micrantha* (Twoscale Saltbush), *Dittrichia graveolens* (Stinking Fleabane) and *Pastinaca sativa* subsp. *urens* (Eastern Parsnip).

The site is in full sun, albeit with some shelter. Associated species within a couple of metres or so include *Anacamptis pyramidalis* (Pyramidal Orchid), *Carex flacca* (Glaucous Sedge), *Galium album* (Hedge Bedstraw), *Leucanthemum vulgare* (Oxeye Daisy) and *Pulicaria dysenterica* (Common Fleabane). Observations on 1 June showed that the pollinia in at least the lower four flowers of the *S. vomeracea* plant had been removed from their column and stuck to the stigmatic cavity, with the ovaries beginning to swell in the lower three. By 13 June at least seven ovaries were swollen, so spontaneous seed-set appeared to have occurred. This was a surprise. *S. vomeracea* is highly self-compatible (as artificial pollination demonstrates); but its morphological structure generally (i.e. in some 97% of cases) prevents self-fertilisation without some form of intervention; natural fruit-set in open-pollinated populations has been recorded at 13.4% to 20.9% (Pellegrino *et al.*, 2006[763]).

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[761] Kitchener G., Mills, D., Buckingham, S., Johnson, D. & Lemon, S. (2021). *Serapias vomeracea* Burm. f. (Briq.) (Long-lipped Tongue-orchid): first wild record for Britain and Ireland. *BSBI News* **146**: 7-10.

[762] This is not a normal approach for the rare plant register, but risk is particularly high in relation to the rarest orchids. It is hoped that, whether by seed or vegetative reproduction, the single plant may be capable of building up a colony (cf. *Serapias lingua* near Tiptree in Essex, which built up to a colony of 61 flowering spikes, assumed to be by vegetative spread, before it received general attention in 2017). However, the degree of knowledge of its whereabouts has resulted in damage to surroundings by photographers in 2021.

[763] Pellegrino, G., Noce, M.E., Bellusci, F. & Musacchio, A. 2006. Reproductive Biology and Conservation Genetics of *Serapias vomeracea* (Orchidaceae). *Folia Geobotanica* 41: 21-32

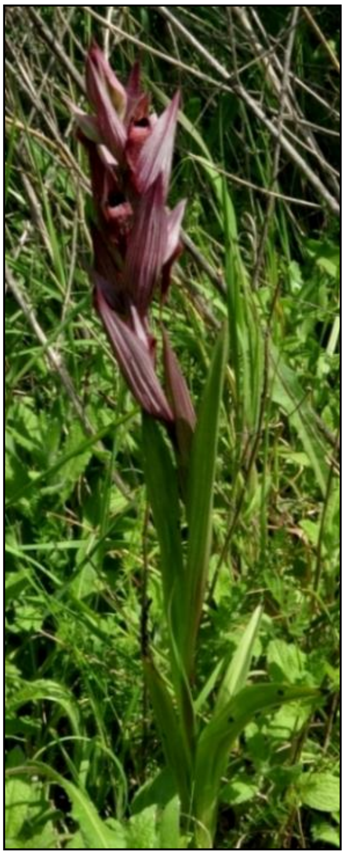
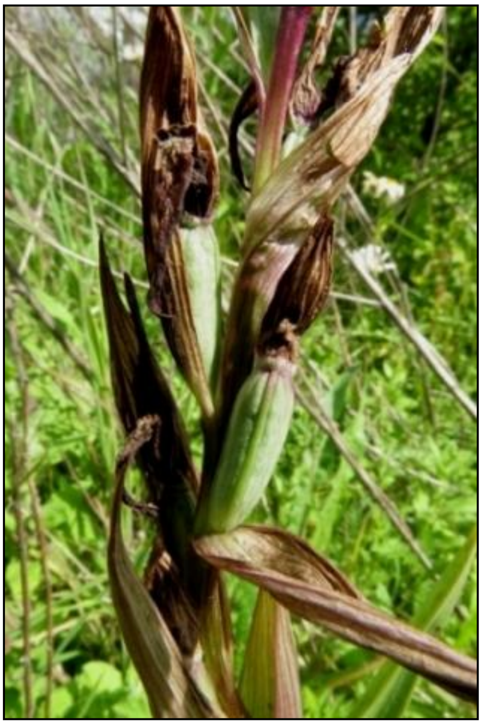


Photo by Daphne Mills, May 2020

The pollination strategy of this species is based on the sepals, petals and lateral lobes of the hypochile forming a small tube in which insects may rest or shelter, removing and transferring the pollinia in the process. This insect behaviour is described by Dafni *et al.* (1981[764]) from observations in Israel of male solitary bees. Female solitary bees usually sleep in their own nest-holes, but males apparently may seek holes more widely for rest after their morning activity and *Serapias* flowers, through mimicry, offer what appear to be appropriate bee-refuges, with their dark colour. Such light as may penetrate through the reddish flowers is in the part of the spectrum invisible to bees and so will appear even darker to them. Given that the male bees moved from flower to flower after investigating them (and in the process, pushing the column and dislodging the pollinia), Dafni *et al*. considered that the shortness of the tube may discourage a stay; although for those bees which settle overnight, the morning flower temperature exceeds the ambient temperature by up to 3°C, enabling the bees to become active earlier at less expense of energy. The sleeping behaviour was observed mostly in Israeli species of *Eucera*, but also *Andrena*, *Osmia* and *Tetralonia*. Pellegrino et al. (2005)[765] have observed Italian *Eucera* and *Osmia* pollinating, as well as *Ceratina*. All these genera except *Tetralonia* are represented in the British Isles and Kent has, for example, 56 species of *Andrena* and nine of *Osmia*, of which several in both genera are common (Allen, 2009).



Fruiting. Photo by Daphne Mills, 13 June 2020

Pollination of the Kent plant suggests that similar solitary bee behaviour may occur here, and the warm sunny weather at the time of lowering will have been conducive to bringing out bees. It is possible, however, that more generalist pollinators were also involved, Pellegrino et al. (2005) having found the main pollinators in the populations they examined to be *Oedemeridae* spp. (False Blister Beetles, or Pollen-feeding Beetles) and *Lymexylidae* spp. (Timberworm Beetles), which also have British representatives. The former are more likely to be relevant as frequenters of flowers, with *Oedemera lurida* and *O. nobilis* commonly recorded in Kent (Laurence Clemons, pers. comm.). So far as concerns the potential of this plant to develop into a colony, seed set is encouraging, but the species is also generally regarded as capable of spreading vegetatively by the production of one to four new tubers on long stolons in years with favourable climatic conditions; ordinarily, a plant may be found with two tubers, one giving rise to the current year's growth, the other being a remnant from the previous growth season. Two flowering stems appeared in 2021.

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[764] Dafni, A., Ivri, Y. & Brantjes, N.B.M. 1981. Pollination of Serapias vomeracea Briq. (Orchidaceae) by imitation of holes for sleeping solitary male bees (Hymenoptera). *Acta Bot. Neerl*. 30: 69-73.

[765] Pellegrino, G., Gargano, D., Noce, M.E. & Musacchio, A. 2005. Reproductive biology and pollinator limitation in a deceptive orchid, *Serapias vomeracea (*Orchidaceae). *Plant Species Biology* 20: 33-39.

In 2022 three spikes emerged and grew well until mid-June, after which they rapidly withered away, described as though something had been poured over them. If that was the case, then possibilities are the attentions of a fox, or deliberate human vandalism (perhaps attracted by a warning notice which had been installed).

Capsule. Photo by Daphne Mills, 8 July 2020

There are three other tongue-orchids which have been recorded in the British Isles in recent years: *Serapias parviflora* (Small-flowered Tongue-orchid), *S. lingua* (Tongue-orchid) and *S. cordigera* (Heart-flowered Tongue-orchid). They are separated from *S. vomeracea* by the latter having flowers with the outer part of the lip (epichile) narrower than the cup-shaped inner part (hypochile), so distinguishing from *S. cordigera*; by the hypochile having two parallel protuberances at its base, so distinguishing from *S. lingua*, which has only one; and by the epichile usually pointing vertically downwards and being at least twice the length of the hypochile (scarcely longer in *S. parviflora*). The *S. vomeracea* complex has received varied taxonomic treatments, but whether adopting splitters' or lumpers' views, the Kent plant has been confirmed as *S. vomeracea*, as distinct from any segregates which may have received different names.

Kent Rare Plant Register

Species accounts Part Serr- Su

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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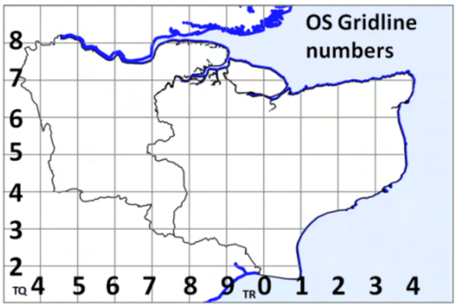
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

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AM Alison Mitchell (Plantlife)
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BBa Brian Banks
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BP B. Pardon
BW Brian Woodhams
CEC Carter Ecological Consultants
CO Colin Osborne
CR Chris Rose
DC Danny Chesterman
DCh David Chambers
DG Doug Grant
DM Daphne Mills
EGP Eric Philp
FB Fred Booth
FR Francis Rose
GK Geoffrey Kitchener
GPR G.P. Radley
GS Geoff Smith
JA Jan Armishaw
JBe Jim Bevan
JG José Gibbs
JM Joumana Mobarak
JP Joyce Pitt
JRP John Palmer
JS Judith Shorter
JW Jo Weightman
KBRG Kent Botanical Recording Group
KC K. Chandler
KCS Ken Side
KFC Kent Field Club
KWL K.W. Lite
LNHS London Natural History Society
LR Lliam Rooney
MAS Mark Spencer
ME Michael Easterbrook
OL Owen Leyshon
RD Rhianna Dix
RG Bob Gomes
RM Richard Moyse
RMB Rodney Burton
RoF Lady Rosemary FitzGerald
RR Rosemary Roberts
SB Sue Buckingham
SCW S.C. Woolvden
SD'A Stephanie D'Agorne
SL Stephen Lemon
SMH Stuart Hedley
SP Sue Poyser
TI Tim Inskipp
WJM W.J. Morgan

Otherabbreviations and references:

BSBI = Botanical Society of Britain & Ireland	KWT = Kent Wildlife Trust	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
CGE = Cambridge University herbarium	LNHS = London Natural History Society	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
Hanbury & Marshall (1899) refers to their *Flora of Kent*	MOD = Ministry of Defence	

Serratula tinctoria L. (Saw-wort)

vc 15, 16

Rarity / scarcity status

Serratula tinctoria is a widespread perennial of grassland, open scrub and woodland and other habitats; absent from Ireland and most of Scotland, and from much of East Anglia and Kent. Its threat status for conservation purposes is one of 'Least Concern'. In Kent it is **scarce**, perhaps **rare**. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first published Kent record for Saw-wort was by Edward Jacob in his *Plantae Favershamienses* (1777), as uncommon '*Near the late Decoy Ponds at* Graveney'. This location would appear to be at TR 0328 6418, within the area of the proposed Cleve Hill Solar Park, and what would in Jacob's time have been brackish grazing marshes. There do not appear to have been other similar habitat records in the county, but the underlying Thames Group geology (London Clay) has been shared by Francis Rose 1954 records near Bromley Common and at Lodge Hill, Chattenden. The first of these may be the same area as was given earlier by Hanbury & Marshall (1899), and as recorded subsequently under the description of the clayey northern edge of Crofton Wood. The second may be the same as found by John Stuart Mill in 1863.

Roger's Rough Road. Photo by Sue Buckingham, 15 August 2013

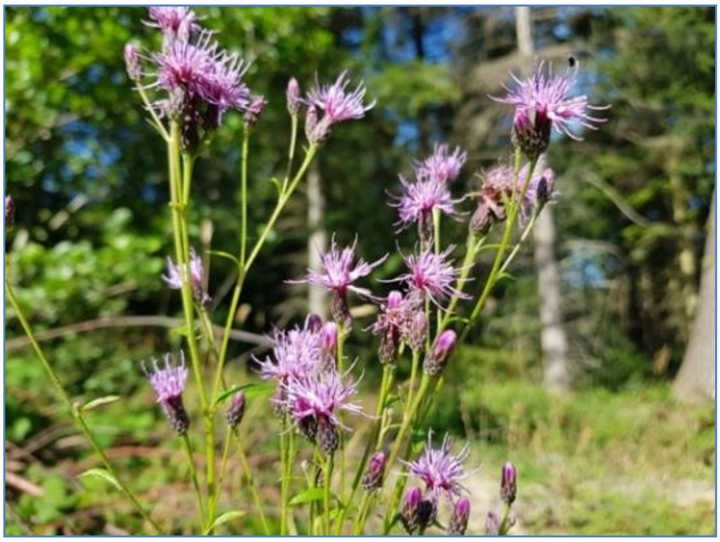
Account:

Hanbury & Marshall (1899) treated the species as rare, in woods, heaths and grassy places. They gave also records at Keston Common, Hayes, and near Dover. This last location (if the plant was correctly identified) suggests an affinity with basic soils which is recognized in some occurrences elsewhere in the British Isles involving grassland on chalk or limestone, but is anomalous as regards the Kentish distribution. This distribution, setting aside the London Clay records, has become increasingly focussed on the acid High Weald soils. Marshall himself recorded Saw-wort in several woods around Cranbrook; and other pre-1899 sightings were reported at Soper's Lane and near Hensill, both near Hawkhurst. These last locations may have continued: Francis Rose's manuscript *Flora of Kent* gives a 1949 record for a lane near Sisley (this could be Soper's Lane) and a 1955 report at a path bank south west of Hawkhurst, TQ 753 303 (this is near Hensill). Other High Weald records given by Rose for the 1940s and 50s include:

(1) a lane bank south west of Mopesden (this is likely to be in TQ7331, the old lane running north east from what is now marked Little Pix Hall Farm on the Ordnance Survey);
(2) Old Park Wood, east border (presumably TQ7537 or TQ7538);
(3) Combwell Wood, on heathy land on the north border but with a south aspect (if Combwell Wood is treated as including Park Wood to the north, this is bounded by Roger's Rough Road, where the plant is currently known);
(4) south east of Kilndown (N.B. Roger's Rough Road extends here; perhaps the same location);
(5) Rosemary Lane, Flimwell (see table entries below);
(6) Chittenden Wood and hedgebanks to the east (eastwards is Causton Wood, and perhaps this was intended as well).

These locations are given in detail to encourage re-finding, and because later records are mostly at no better than tetrad resolution. All the High Weald records are within TQ73 and TQ83, and all are on Tunbridge Wells Sandstone.

Philp (1982) gave seven tetrad records for 1971-80, all within High Wealden hectads TQ73 and TQ83, except for Chattenden on the Hoo peninsula, and for a record in TQ63E which, although within the administrative county of Kent, is believed to have been in vc14, East Sussex. The species was described as rather rare, on roadsides and woodland margins and rides. Philp (2010) gave the same tetrads for 1991-2005, except that the plant was not found at Chattenden. There was accordingly no evidence of material decline.



Chittenden Wood, Sissinghurst. Photo by Sue Buckingham, 24 August 2021

However, our 2010-24 records have been limited to two locations. The first is represented by2013 and 2017 sightings at Roger's Rough Road near Kilndown where overshading by trees and shrubs from adjoining woodland appears to be detrimental. Plants were on a roadside with acid soil, the underlying geology being Tunbridge Wells Sandstone, and accompanied by other species characteristic of good quality habitat in such a situation, all being designated Kent axiophytes: *Betonica officinalis* (Betony), *Solidago virgaurea* (Goldenrod) and *Succisa pratensis* (Devil's-bit Scabious). The second site is at Chittenden Wood, Hemsted Forest, where in 2021 two flowering plants were observed on either side of a wet ride and within a few metres of a line of four oaks which border an area where conifer had been cleared several years previously. The presence of oaks, from observations elsewhere, may be relevant to habitat; and the site shared with Roger's Rough Road an associated flora which included *Betonica officinalis* and *Succisa pratensis.* The quality of that flora is underlined by the presence of further Kent axiophytes, viz. *Carex demissa* (Common Yellow-sedge), *Molinia caerulea* (Purple Moor-grass), *Potentilla erecta* (Tormentil) and *Ranunculus flammula* (Lesser Spearwort).

It may be premature to assume that there has been a sudden recent decline elsewhere; further search needs to be made of earlier locations.

Habitat, Chittenden Wood, Sissinghurst. Photo by Sue Buckingham, 24 August 2021

Serratula tinctoria is able to accommodate to a wide range of soils, from acid to moderately alkaline (which may be reflected in differing genotypes) and generally with low levels of soil fertility, with a wide range also of water conditions[766]; in Kent, however, it is currently limited to acid soils. It is a perennial spreading within a limited distance by wind-dispersed seed, but with only a short term persistent seed-bank; it can also propagate vegetatively by forming rosettes at the end of short stolons. Seedling establishment appears to require some open ground resulting from disturbance, and high nutrient availability discourages seedlings. Maintenance of populations is assisted by some form of management such as cutting or grazing, but not July-September when flowering and seed development takes place. It is generally regarded as an indicator of semi-natural habitats of high biodiversity and appears in most British county axiophyte lists.

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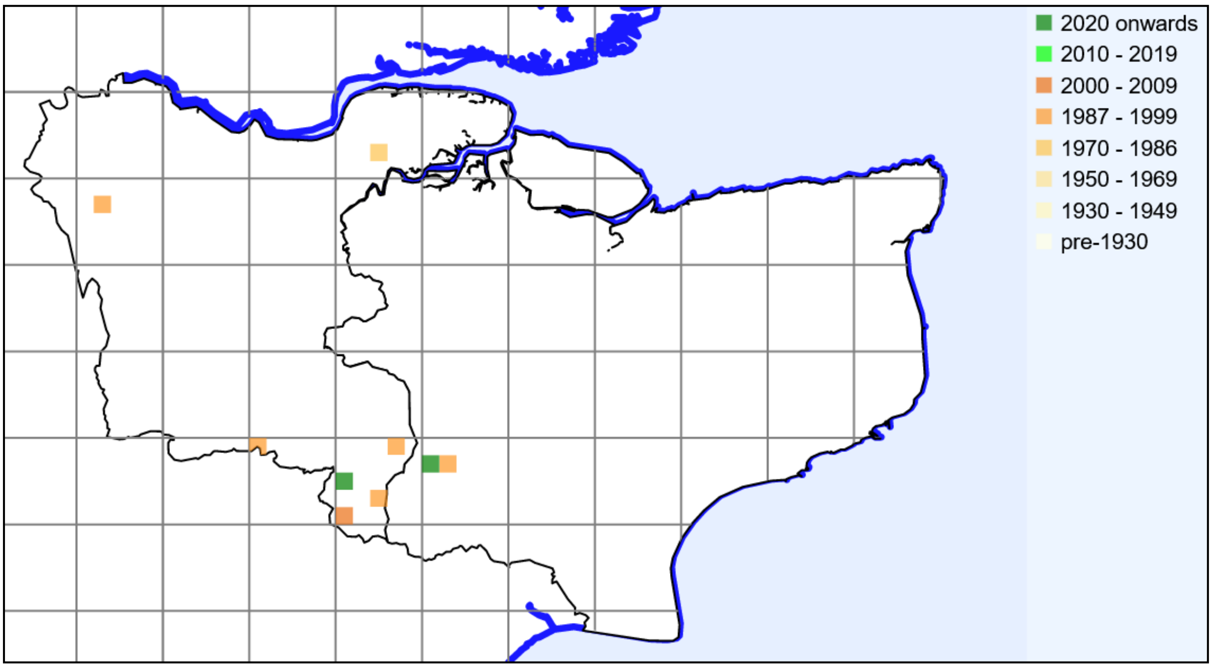
[766] Jefferson, R.G. & Walker, K.J. (2017): Biological Flora of the British Isles: *Serratula tinctoria. Journal of Ecology* **105**: 1438-1458.

Serratula tinctoria **Kent records to 2024 mapped at tetrad level, from BSBI database.**



Site	Grid reference	Site status	Last record date	Recorder	Comments
Forest Hill (metropolitan vc16)	TQ37L		1974	KWL	Railway bank.
Crofton Heath (metropolitan vc16)	TQ46I		1987	JP	TQ 433 660, corrected to TQ 435 659 by JP in 2021. Edge of oak woodland on clay, over 40 plants, close to boundary where new houses had been built and scrub had been cleared back. Since then, the area has become overgrown [*Serratula* not found - four large mature oaks over dense hazel scrub, etc., with garden rubbish present, JP, 2021.] There are older records for the north side of Crofton Wood, but much of this boundary disappeared after the 1960s with the construction of Hollingworth Rd, Rollestone Avenue, etc.
Flimwell	TQ73A		27 August 2004	SB	Recorded as part of Local Change survey and believed to have been in TQ7031, roadbank on east side of Rosemary Lane between Downash House bridleway and Bewl Water (administrative county of East Sussex, but vc16).
Kilndown south east	TQ73C	KWT roadside nature reserve	(1) 30 July 2019 (2) 15 August 2013 (3) 1991-99 (4) Before 1981, after 1970	(1) SL (2) SB (3) EGP (4) Philp (1982)	(1) Prior's Heath Wood, south facing bank along Rogers Rough Road (KWT Roadside Nature Reserve), TQ 7085 3474, where bank faces entrance gates to Combwell Wood and only semi-shaded. The rest of the bank

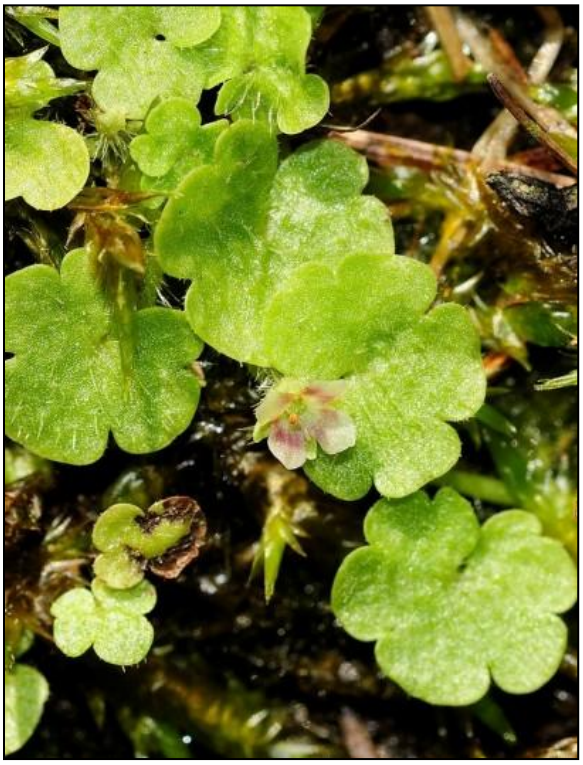
					shaded by trees facing it along the edge of Combwell Wood. Three non-flowering plants, one each at base, middle and top of bank. (2) Three plants on roadside bank north side of Roger's Rough Road at TQ 70864 34746 on KWT Roadside verge, under oak and with *Betonica officinalis*, *Solidago virgaurea* and *Succisa prat*ensis. More plants have been recorded further east on roadside in TQ7134 but bank there is now shaded by trees and shrubs from adjoining woodland. (3) & (4) TQ73S.
East of Bedgebury Forest	TQ73L		(1) 1991-99 (2) Before 1981, after 1970	(1) EGP (2) Philp (1982)	(1) & (2) TQ73L.
Hocker Edge	TQ73U		(1) 1991-99 (2) Before 1981, after 1970	(1) EGP (2) Philp (1982)	(1) & (2) TQ73U.
Chattenden	TQ77L		Before 1981, after 1970	Philp (1982)	TQ77L, by AGS, KCS & GS. Records for Lodge Hill, Great Chattenden Wood go back at least to 1899.
SE of Sissinghurst	TQ83D, includes TQ8136	Access land	(1) 24 August 2021 (2) 1991-99 (3) Before 1981, after 1970	(1) SB (2) EGP (3) Philp (1982)	(1) Two flowering plants one at TQ 81803 36635 the other at TQ 81801 36647 on either side of a wet ride in Chittenden Wood and within a few metres of a line of four oaks which border an area where conifer had been cleared several years previously. Associated plants included: *Molinia caerulea*, *Carex demissa*, *Ranunculus flammula*, *Mentha aquatic*a, *Potentilla erecta*, *Cirsium palustre*, *Succisa pratensis* and *Betonica officinalis*. (2) & (3) TQ83D.
Causton Wood	TQ83I	Access land, Local Wildlife Site	(1) 20 May 1999 (2) 1991-99 (3) 6 September 1986 (4) 1985 (5) Before 1981, after 1970	(1) JP & JW (2) EGP (3) CJ (4) JP (5) Philp (1982)	(1) TQ 820 362 (this may be a generic LWS gridreference). (2) TQ83I (3) TQ 820 362. (4) TQ 820 362, decreasing - hangs on in a few places in broad-leaved strips along northern perimeter of Local Wildlife Site. (5) TQ83I.

Sibthorpia europea L. (Cornish Moneywort)

vc 16

Rarity / scarcity status

Sibthorpia europea, a small, creeping perennial, grows in damp acidic habitats in south west England, Wales and Ireland and in the Channel Islands. The only exception to this distribution has been the Sussex Weald, where it may be regarded as part of the western Atlantic flora which has persisted in appropriate microhabitats. Its conservation risk is, in England and in Great Britain as a whole, one of 'Least Concern'. In Kent, it was unknown until 2017 (other than, for a while, as a lawn weed of doubtful status), but may still have native status here as an outlier of the Sussex Wealden populations. Restricted to one locality in the county, it is very **rare**.



Chingley Wood. Photo by Lliam Rooney, 11 August 2018

Account:

The first Kent record for Cornish Moneywort is as a lawn weed, given without comment as to status, although assumed here to have been introduced, but by unknown means. It was discovered about 1968 by K.E. Bull at Bayhall Road, Tunbridge Wells (TQ5939) and was at first named as *Hydrocotyle microphylla.* It persisted at least until 1975, when it was named by E.J. Clement as a small-leaved and compact form of *Sibthorpia europea*[767].

Its first Kent discovery in a location which is suggestive of potential for native status was made by Stephen Lemon on 14 August 2017 (with further observation on 17 and 26 August) at Chingley Wood, which comprises acid woodland managed as Sweet Chestnut coppice, on Tunbridge Wells Sand Formation. It was confined to a 90 or 100 metre stretch of a wayleave area below power lines, which had been kept open by mowing, and where it flowered abundantly, in places forming sprawling patches up to a couple of metres across, particularly on barer soil around vehicle tracks. The population could not be assessed as individual plants, due to the interconnection of the patches. Plants growing at the edge of the wayleave area were often larger, possibly due to the effect of Bracken over-shading.

Chingley Wood. Photo by Stephen Lemon, 17 August 2017

Associated species were characteristic of acid woodland rides: *Blechnum spicant* (Hard-fern), *Galium palustre* (Marsh-bedstraw), *Gnaphalium uliginosum* (Marsh Cudweed), *Hypericum pulchrum* (Slender St John's-wort), *Hypericum humifusum* (Trailing St John's-wort), *Juncus bulbosus* (Bulbous Rush) and larger *Juncu*s spp., *Lythrum portula* (Water-purslane), *Persicaria hydropiper* (Water-pepper), *Potentilla erecta* (Tormentil),

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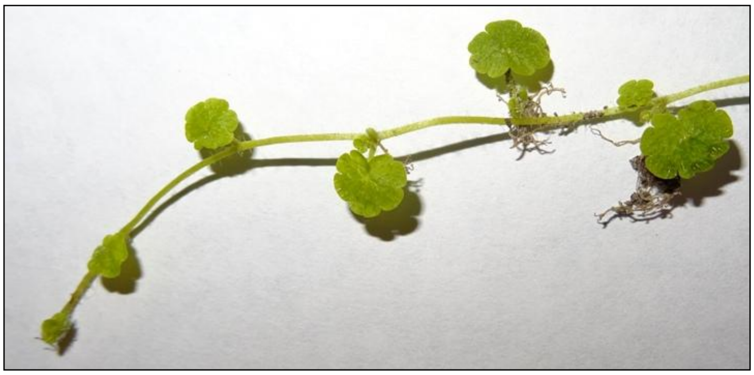
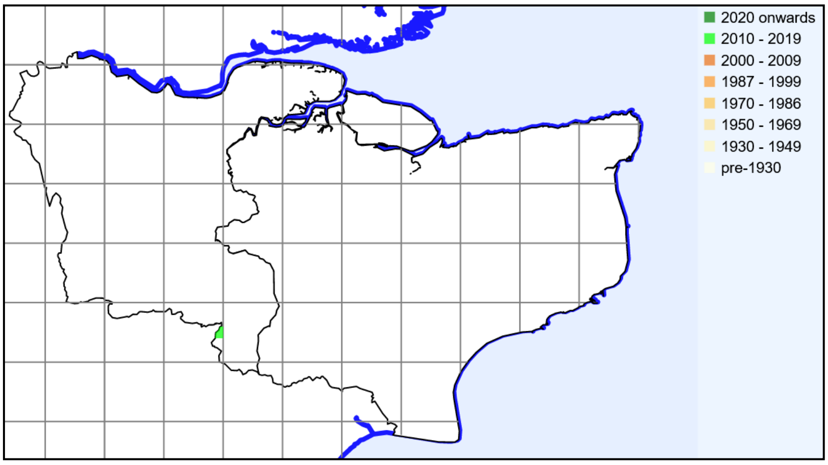
[767] E.J. Clement (1975): Adventive News 4. *BSBI News* **11**: 10-12.

Potentilla x *mixta* sens. lat. (Hybrid Cinquefoil), *Prunella vulgaris* (Selfheal) and *Scutellaria minor* (Lesser Skullcap); also the liverwort *Pellia epiphylla*. The un-mown edges of the wayleave area were dominated by *Pteridium aquilinum* (Bracken). *Calluna vulgaris* (Heather), *Carex pilulifera* (Pill Sedge) and *Galium saxatile* (Heath Bedstraw) were also in the mown wayleave land on dryer ground to the south east, away from the *Sibthorpia*.



From Chingley Wood. Photo by Stephen Lemon, 14 August 2017

The south eastern end of the colony began with stragglers at TQ 69147 34163, just beyond a newly coppiced area of Sweet Chestnut along the side of the wayleave area. From this point the colony was bordered on both sides by tall trees, mostly mature Sweet Chestnut coppice. The ground gently slopes to the south west and the colony was focussed along a shallow dip where the ground is damp, roughly on the OS map 80 metre contour line. The north western edge of the colony ended quite abruptly, c. TQ 6908 3422, near where the ground along the wayleave area rises slightly and becomes more dominated by grasses. The association with damp ground is characteristic of the species, and the Sussex occurrences have been described as in ‘Moist shady places, usually by streams’[768]; Francis Rose also referred to the species as present in the wooded gills of the High Weald, e.g. at Nap Wood, Darlington Forest (stony stream banks), and in flushed areas and wet trackways of Heathfield Park[769]. Chingley Wood affords a degree of parallel to these other acid Wealden localities, although the *Sibthorpia* site is not as close to the stream areas in the wood as might offer the closest parallel, and search has not produced finds along its gill stream banks and other trackways. Despite the Sweet Chestnut plantings, it appears to be ancient woodland, the wood name going at least back to the first half of the sixteenth century and woodland being depicted here in the 1797 Ordnance Survey drawings.



***Sibthorpia europaea* Kent records to 2024 mapped at tetrad level, from BSBI database.**

What is not clear, however, if *Sibthorpia* is taken to have native status here, is the manner of continuity of habitat from before the establishment of the current wayleave area which aerial surveys show as being present at least back to 1990. Whilst the species appears suited to semi-shade conditions, it is, where growing in open habitats, at risk of being out-competed by other vegetation if the openness ceases to be maintained[770], and Bracken could well dominate the wayleave area if not mown back. *Sibthorpia* is, at least in the Azores[771], capable of forming a large and persistent seed-bank, and of germinating and establishing following disturbance. This behaviour may have offered scope for continuity through changes in the Chingley Wood environment. However, the current absence from any streamside habitat in Chingley Wood is a factor pointing against native status.

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[768] Hall, P.C. (1980): *Sussex Plant Atlas*. Borough of Brighton, Booth Museum of Natural History.

[769] Rose, F. (1995): *The Habitats and Vegetation of Sussex.* Borough of Brighton, Booth Museum of Natural History

[770] Stroh, P.A. 2015. *Sibthorpia europaea* (L.). Cornish Moneywort. Species Account. Botanical Society of Britain and Ireland.

[771] According to studies cited by Stroh (*vide supra*).

It may be regarded as surprising that a native, if that is the species' status here, may have persisted without detection. However, Chingley Wood is privately owned without public access. *Sibthorpi*a may readily be overlooked for a range of unrelated species, especially when they are in a seedling state, including *Alliaria petiolata* (Garlic Mustard)*, Chrysosplenium* spp. (Golden-saxifrages), *Filipendula ulmaria* (Meadowsweet), *Geum urbanum* (Wood Avens), *Glechoma hederacea* (Ground-ivy) and *Lamiastrum galeobdolon* subsp. *montanum* (Yellow Archangel)[772]. It is distinguishable from *Hydrocotyle vulgaris* (Marsh Pennywort) by the latter having rounder leaves, held aloft on longer petioles, rather than kidney-shaped leaves held low as part of a creeping mat.

Habitat, Chingley Wood. Photo by Stephen Lemon, 17 August 2017

The alternative explanation for its presence in Kent, viz. by way of introduction on equipment used in the maintenance of the power lines and their associated wayleave area, would require seed transmission from one of the very few Sussex sites, or otherwise from as far away as Somerset. This is not impossible, although fairly unlikely.

This account has benefited greatly from the assistance of Stephen Lemon.

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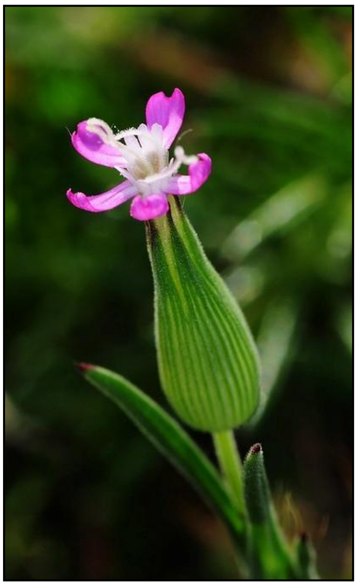
[772] Pryce, R. & Chater, A. (2000). Overlooking Sibthorpia*, BSBI News* **84**: 50-51, 82.

Silene conica L. (Sand Catchfly)

vc 15; only ever a casual in vc 16, long since gone

Rarity / scarcity status

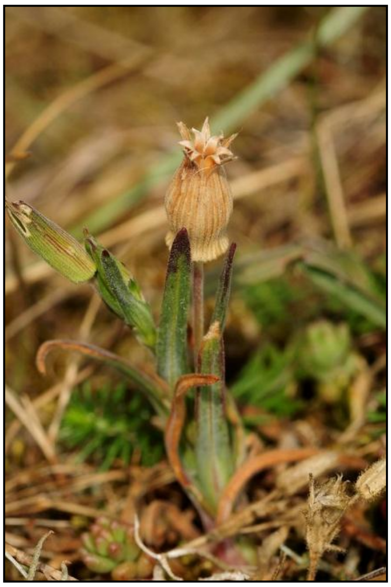
Silene conica is a **nationally scarce** annual of sandy habitats, mostly coastal in southern Britain, and is considered **Vulnerable** to the risk of extinction in Great Britain, **Endangered** in England, as a comparison over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 51% reduction in the likelihood of recording the species. In Kent it has only ever been found (other than as a casual) in two areas, Deal/Sandwich and Littlestone/Greatstone, although there has been variability in the extent of records at each location, with Philp (1982) giving three tetrads and Philp (2010) giving seven. Accordingly, there does not seem to be evidence of decline in parallel with the national position, and for the period 2010-23, there were still records for six tetrads (eight monads). The species should be regarded as **scarce** in Kent. It is a Kent axiophyte and so is indicative of good habitat.



Littlestone. Photo by Lliam Rooney, 5 June 2010

Account

The first published Kent record is in the third edition of Ray's *Synopsis Methodica Stirpum Britannicarum* (1724), edited by Dillenius, a record contributed by James Sherard and Isaac Rand, 'A little to the North of *Sandown* Castle, plentifully'. This appears to correspond to the area of dunes called Tenant Hills (TR3754), where the plant may still be found, and there is a long sequence of historical records running back to Sherard and Rand. Dillenius may have acquired the record via a specimen marked " A new *Lychnis* found at Dover by Mr Sherard in 1715", contained in the Du Bois Herbarium at Oxford, assuming that the note conflated Deal and Dover[773]. The Littlestone area has also long been known, J.E. Smith reporting it in his *Flora Britannica* (1800, vol.2, p.470) as 'Opposite the Warren house at New Romney, Kent. *Rev. Mr. Stacey*.' Warren House is still there, at TR 0767 2593 on Dymchurch Road, and opposite it are old fixed dunes near Romney Marsh visitor centre. It was seen here in 1946 by Francis Rose, by the New Romney-Dymchurch road, and again in 1986; but more recent sightings are on the coastal parts of the Warren.



In fruit, Littlestone. Photo by Lliam Rooney, 11 June 2011

Hanbury &Marshall (1899) considered it to be generally very rare; so did Francis Rose, albeit treating it as very locally frequent on sand-dunes, especially in slightly disturbed ground. There is a suggestion in Stace (2019)[774] that all British populations, other than at the Brecklands, may be non-native (the species' core distribution being south-western and central Europe, especially around the Mediterranean). There are indeed widespread British records of introductions, marked as such in the mapping of Briggs (1994)[775], although the Kent records are treated as native. Not only do the Kent populations appear in very appropriate habitat for native status, but the 1715/1724 records are the first for the British Isles. The coastline at Deal/Sandwich and Littlestone/Greatstone has, however, changed greatly in historic times and before, so that current sites for the species would not all necessarily have existed as land even in the mediaeval period, but presumably plants could have moved with shifting habitat.

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[773] Druce, G.C. (1928). British Plants contained in the Du Bois Herbarium at Oxford, 1690-1723. *B.E.C. Report for 1927*, **8**: 463-493. Note that Robert Uvedale's herbarium, incorporated into the Sloane herbarium included a specimen labelled as found at Sandown by Mr. J. Sherard, according to Dandy, J.E. [J.Britten] (1958). *The Sloane Herbarium: an Annotated List of the Horti Sicci Composing it; with Biographical Details of the Principal Contributors* (London: British Museum).

[774] Stace, C. (2019). *New Flora of the British Isles*, 4th edn. Cambridge University Press, Cambridge.

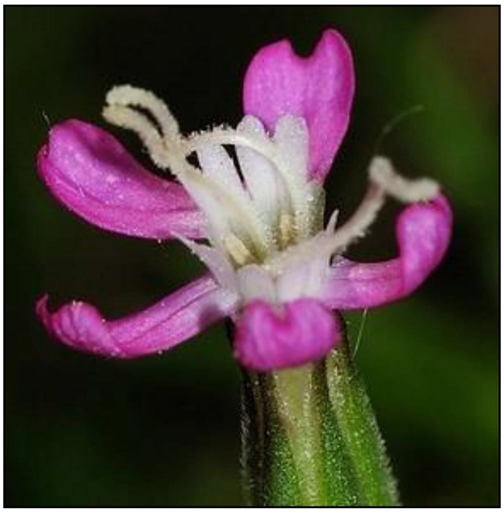
[775] Briggs, M. *Silene conica* L. Sand catchfly. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. (1994) *Scarce Plants in Britain*, JNCC, Peterborough.

Within the two areas of long-established distribution, Philp (2010) recorded it on stabilised dunes and sandy shingle, although an apparent increase of records since the 1971-80 survey of Philp (1982) looks as though it represents more intensive recording rather than an expansion of the plant's presence.

Habitat, Littlestone. Photo by Owen Leyshon, 20 May 2010

Our 2010-24 records show a broadly similar distribution, on sandy banks and dune slopes, especially where bare ground is present. This period included searches in connection with the BSBI's Threatened Plants Project, which involved checking on the survival of plants at selected sites with previous records. The information generated enabled various conclusions to be drawn.

A bare, sandy footpath margin across the fixed dunes at Prince's Golf Course, Sandwich generated three plants in 2011 where 150 had been seen the year before. Population fluctuations are not unexpected with annuals. *Silene conica* is a winter annual germinating in late summer, with cotyledons over-wintering, and the low numbers were considered to be perhaps the consequence of the exceptionally dry spring of 2011. This affected many annuals, and could have prejudiced *Silene conica* even though the species can apparently cope with a spring water deficit (although numbers can be affected by a wet winter causing mortality, or a previous summer being insufficiently hot to ripen seed). *Silene conica* benefits from bare ground or open turf for seedling establishment and avoidance of competition; the Sandwich site was kept bare and suitable by the passage of golf course vehicles and buggies.



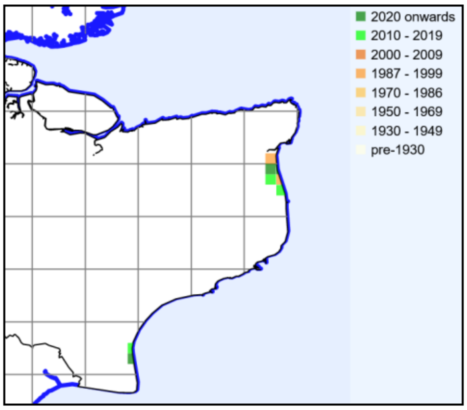
Littlestone. Photo by Lliam Rooney, 5 June 2010

A second Sandwich site was investigated in 2013, fixed dune grassland owned by St. George's Golf Course, but not used or maintained other than for sheep-grazing. A few plants were closely grouped at an area of bare sand beside a rabbit burrow. The general shortening of turf by grazing together with the ground disturbance created by rabbits appears beneficial to survival of *Silene conica*, even though the rabbits had part-chewed the plants.

Another Threatened Plants Project site was at Littlestone Greens where a few plants were re-found on a semi-bare sandy bank supporting Grand Parade and adjoining flat sandy coastal grassland. Here there was an issue as regards whether encroaching vegetation might require artificial disturbance to maintain bare ground, a problem not shared by a nearby site with 34 plants on the top and sides of sandy banks, probably the site on an old building and more likely to be disturbed by public passage.

At all four sites (two at Sandwich; two at Littlestone), *Silene conica* grew with associated species *Elymus athericus* (Sea Couch) and *Koeleria macrantha* (Crested Hair-grass), both plants that may grow in fixed dune habitats. Also present at both Sandwich and Littlestone were *Hypochaeris radicata* (Cat's-ear), an effective coloniser especially tolerant of poor or nutrient-deficient soils; *Plantago coronopus* (Buck's-horn Plantain), another coloniser of bare sandy or gravelly soils; and *Plantago lanceolata* (Ribwort Plantain), a ubiquitous coloniser. Particularly indicative of habitat were *Carex arenaria* (Sand Sedge) and *Phleum arenarium* (Sand Cat's-tail) at St. George's; *Cerastium semidecandrum* (Little Mouse-ear) and *Erodium cicutarium* (Common Stork's-bill) at both Sandwich sites; and *Cerastium diffusum* (Sea Mouse-ear) and *Salvia verbenaca* (Wild Clary) at Littlestone.

***Silene conica* Kent records to 2024 mapped at tetrad level, from BSBI database.**



The Threatened Plants Project surveys were of relatively small numbers. Larger colonies have been noted, e.g. 200 plants at the Royal Cinque Ports Golf Course in 2016, and the largest count has been in 2019 at Greatstone dunes, 2520 plants. Seeds are small and seed production is large (8335 ± 848 per plant in German investigations); seed spread is likely to be by wind, but propagules can attach to animals and have germinated after passage through sheep (Stroh, 2015, and sources cited there[776]).

Silene conica is a distinctive plant by virtue of its swollen, glandular-haired calyx with c.30 distinct raised veins. It may be missed because of its small size, often bearing only a single inflorescence.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Littlestone south / Greatstone Dunes	TR0823	SSSI	(1) 10 June 2021 (2) 5 July 2019 (3) 11 June 2011 (4) 5 June 2010 (5) 18 June 2005 (6) 1991-99 (7) After 1970, before 1981	(1) CO (2) SD'A (3) KBRG meeting (4) KBRG meeting (5) JP (6) EGP (7) Philp (1982)	(1) Usual site on grassland ridge between road and sea by carpark. (2) 2520 plants, both flowering and non-flowering, on Greatstone Dunes. (3) (a) 24 plants at TR 08294 23542, 5 at TR 08284 23545, 50 at TR 08280 23531, 12 at TR 08275 23501, all on top or sides of low sandy, part-vegetated humps in dunes. (b) TR 08356 23956, top and sides of sandy banks, possibly old site of building, 34 plants in area 1.5m x 4m. (4) Two patches at south end of Littlestone Green on sandy banks, one 2 x 4m. at TR 08352 23956 with hundreds of plants, the other a few metres westwards, 5 x 2m. with few plants. (5) Large population 200 + plants at TR 08287 23518. (6) & (6) Given as TR02W, but assumed to be monad TR0823.
Littlestone	TR0824	SSSI	(1) 11 June 2011 (2) 5 June 2010 (3) 1991-99 (4) After 1970, before 1981	(1) KBRG meeting (2) KBRG meeting (3) EGP (4) Philp (1982)	(1) TR 08324 24028, 14 plants on sandy embankment below road. (2) At TR 08323 24023, in barish parts along 15m of bank to south end of Littlestone Green, 50 plants. (3) & (4) Given as TR02X, but assumed to be monad TR0824.

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[776] Stroh, P.A. (2015). *Silene conica* L.. Sand Catchfly. Species Account. Botanical Society of Britain and Ireland.

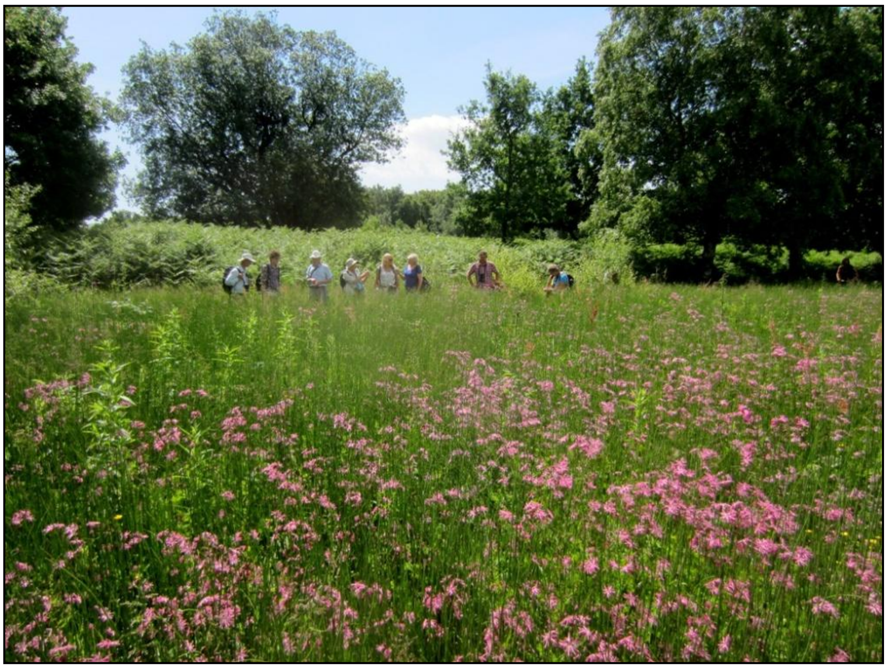
Romney Warren	TR0826	SSSI	(1) 5 June 2010 (2) 8 June 1986	(1) (a) JS (b) DM (2) RF	(1) (a) TR 0876 2614. (b) TR 0870 2601. (2) Romney Warren, NW of main road.
Sandwich Bay estate west	TR3557	SSSI	(1) 17 June 2013 (2) 22 June 2002 (3) 2 March 1983	(1) SB (2) EGP (3) ACH	(1) 42 plants in 2 x 2m. area of sand around rabbit burrow. Dune grassland, part of SSSI owned by St George's golf course. Associated plants - *Erodium cicutarum, Galium verum, Phleum arenarium, Cerastium arvense.* (2) Given as TR35N; assumed to be monad TR3557. (3) TR 353 578. Sandwich & Pegwell Bay survey.
Sandwich Bay	TR3461	SSSI	2 March 1983	ACH	TR 349 618. Sandwich & Pegwell Bay survey.
Sandwich Royal St. George's	TR35P Includes TR3558 and TR3559	SSSI	(1) 21 October 2021 (2) 16 June 2020 (3) 28 May 2016 (4) 11 June 2013 (5) 23 May 2011 (6) 24 June 2010 (7) 22 June 2010 (8) 1991-99 (9) 4 August 1996 (10) 2 March 1983	(1) SB (2) SB (3) AW (4) CO (5) SB (6) SB (7) LR (8) EGP (9) FR (10) ACH	(1) Fruiting plants spread over some 3 metres alongside a public footpath at TR 35371 59912. (2) On Prince's golf course, on sand beside track at TR 35371 59911 flowering and fruiting in spite of drought. (3) TR3559. (4) All in c. 2 sq. m. side of sand hummock on beach car park at TR 359 586. Survived to seed stage 16/07/13, 60+ plants. (5) Three plants on bare sand by footpath at TR 35268 59819. (6) (a) TR 35275 59841, 150 plants on sandy bank beside footpath across Prince's golf course. (b) TR 35428 59179, seven plants on sand bank beside public footpath between Prince's and St George's golf courses (7) 1 plant, TR 359 585. (8) TR35P. (9) TR3559, on shore by toilet. (10) TR 355 585. Sandwich & Pegwell Bay survey.
Sandwich Prince's golf course	TR3560	SSSI	(1) 5 July 1987 (2) 2 March 1983	(1) EGP & RoF (2) ACH	(1) TR 353 603. (2 TR 353 605. Sandwich & Pegwell Bay survey.
Sandwich Bay estate	TR35T Includes TR3656, TR3657		1991-98	EGP	TR35T.
Sandwich Bay estate	TR3658	SSSI	(1) 23 May 2022 (2) 1991-98	(1) KBRG meeting (2) EGP	(1) On the beach dunes. (2) Recorded as TR35U, but the only land monad is TR3658.
Deal –Sandown Castle to Royal Cinque Ports golf course	TR35S Includes TR3755,TR3754	SSSI	(1) 19 July 2016 (2) 31 August 2014 (3) 1991-98 (4) 11 September 1989 (5) 2 March 1983	(1) SB (2) SB (3) EGP (4) SMH, GPR, SCW (5) ACH	(1) (a) Scattered plants in seed on Tenant Hills by public footpath wherever the sand is bare from TR 37358 54902 to TR 37340 54972. Associated species: *Trifolium arvense*, *Phleum arenarium*, *Galium verum*, etc. (b) This a particularly good year for this plant and at least 200 plants in seed on sandy banks beside public footpath from TR 3717 5545 to TR 3710 5563. (2) South-facing dune slope at TR 3726 5523 over 3 x 1 m. area. (3) TR35S. (4) TR 373 553. (5) TR 376 557. Sandwich & Pegwell Bay survey.

Silene flos-cuculi (L.) Clairv. (Ragged-Robin)

vc 15, 16

Rarity / scarcity status

Silene flos-cuculi is widespread in damp grassland and marshy areas across the British Isles. Whilst not yet generally scarce, it is one of a number of species which have been placed in a risk category of **Near Threatened** in England, due to the rate of decline, probably due to habitat loss (e.g. drainage, eutrophication, loss of grazing). A comparison over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 25% reduction in the likelihood of recording the species. In Kent there is evidence of a 39% decline between 1971-80 and 1991-2005, attributed to drying out or development of its habitat. The species is, however, as yet neither rare nor scarce in the county. It is a Kent axiophyte and so is indicative of good habitat.



Gibbin's Brook, Sellindge, habitat (KBRG meeting). Photo by Geoffrey Kitchener, 30 June 2013

Account

Seeds of *Silene flos-cuculi* have been found in iron Age peat deposits and channel fills at the moated mediaeval farm complex excavated at Parsonage Farm, between Hothfield and Westwell, in advance of railway construction[777]; also material from late Roman deposits in a well at Thurnham Roman Villa[778]. However, the first published reference to this species as a botanical record is by Thomas Johnson in his *Iter plantarum* (1629): he encountered it near the public highway between Gillingham and the Isle of Sheppey. It is now conspicuously absent from this part of Kent. He also found it in 1632 en route to Canterbury from Sandwich, listed with many other species of wet habitats. Hanbury & Marshall (1899) regarded it as a common and generally distributed plant of moist meadows, streamsides, etc. For Francis Rose it was a very common plant (except in chalk districts) of streamsides, marshes, fens and wet woodlands, both in alder swamps and wet rides. Records which he collected included Keston and Frizley Bogs; Sandwich dune slacks; Berengrave pit (this is on chalk); meadows by the Darent and the Stour; Snodland and Holborough Marshes; Horish Wood, a ride on Gault; Hoppen Pits Dungeness;fens at Ham and Brook; and various wet or boggy woods, often acid.

This breadth of distribution was still apparent from the 1971-80 county survey published as Philp (1982), when 190 tetrads were recorded, usually on more clayey soils. This reduced to 115 tetrads in the 1991-2005 survey (Philp, 2010), considered to be the result of habitat loss. For the period 2010-24, however, the species was found in 131 tetrads (155 monads), although these figures are not fully comparable, as Eric Philp's records were restricted to the administrative county of Kent, excluding metropolitan north west Kent and eight tetrads belong in that area; in some cases they represent the use of *Silene flos-cuculi* as a 'wildflower' for amenity planting[779].

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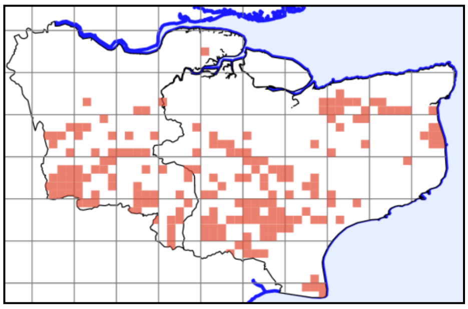
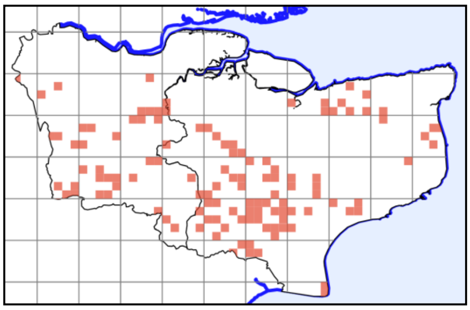
[777] A. Davies [sic] (2006). *The charred and waterlogged plant remains from Parsonage Farm, Westwell, Kent (ARC PFM98)*. CTRL Specialist Report. London & Continental Railways.

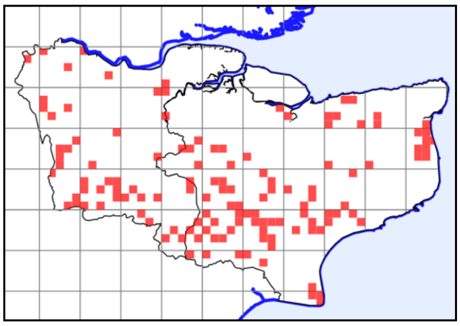
[778] J. Giorgi (2006). *The waterlogged plant remains from well 11010 at Thurnham Roman Villa, Kent (ARC THM 98).* CTRL Specialist Report. London and Continental Railways.



***Silene flos-cuculi*, 1970-86 tetrad records**

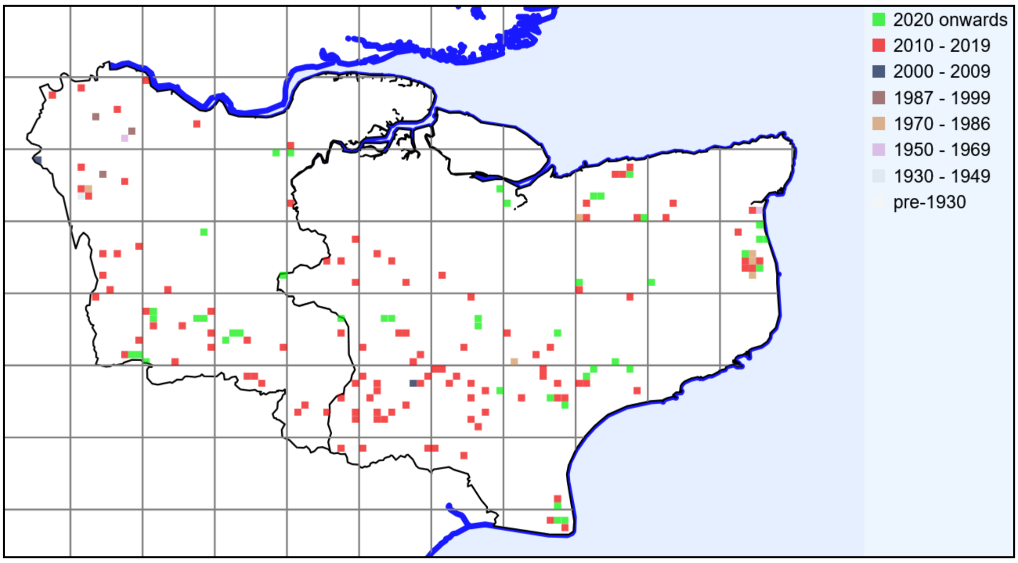


***Silene flos-cuculi*, 1987-2009 tetrad records**



***Silene flos-cuculi*, 2010-24 tetrad records**

While distribution is given below at monad resolution for best detail (but providing a bias to recent records because monad recording has only been the norm in Kent since 2010), mapped data are given above for different periods, taken from the BSBI database, from which it can be seen that:



***Silene flos-cuculi* Kent records to 2024 mapped at monad level, from BSBI database.**

- All recording periods show the species as largely avoiding the chalk downs (where there are few damp habitats), the north Kent marshes and Romney Marsh (where its absence seems to demand explanation, although the grassland there is more species-poor than is generally encountered with *S. flos-cuculi*).
- the 1970-86 records, which include those in Philp (1982) as well as others, are the 'high point' of recording; subsequently it has only been possible to find a much more attenuated distribution.

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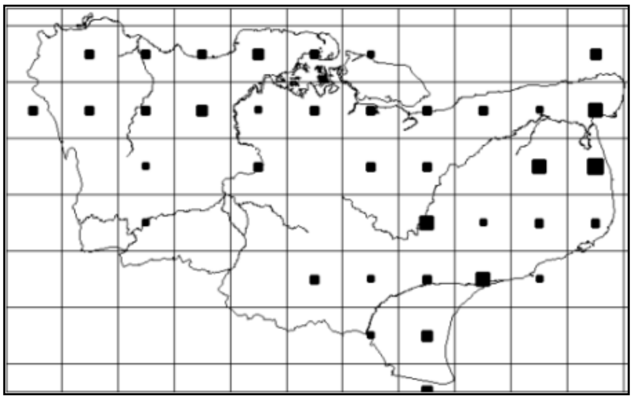
[779] The use of *Silene flos-cuculi* appears to be more significant as a plug plant for wet habitat creation than general seed sowing. 170,500 plug plants were reported sold annually by 15 commercial wildflower providers in the UK: Walker, K.J., Hodder, K.H., Bullock, J.B., Pywell, R.F. (2004). *A review of the potential effects of seed sowing for habitat re-creation on the conservation of intraspecific biodiversity*. Defra Contract BD1447. Centre for Ecology and Hydrology, Monks Wood.

- While the overall numbers for 1987-2009 (which include those for Philp, 2010) are fairly similar to those for 2010-24, there are differences which would make further field investigation worthwhile, e.g. the block of 10km squares TQ66, TQ65, TQ55 and TQ56 (west and south west of Maidstone) accounted for 16 tetrad records in the earlier period, three in the most recent one. Is there really so much habitat loss in this area?

Hothfield. Photo by Lliam Rooney, 19 May 2011

Silene flos-cuculi is a perennial with stems 30-75cm high and so, if it is to develop mature seed, it is best suited to a habitat in which it may reach this stage of growth, e.g. a late-cut hay meadow or damp ground subject to an appropriate grazing regime. It is also capable of spreading vegetatively: one or two side rosettes may be produced in the first year of growth and a flower stalk is initiated from the main rosette, usually not until the second year, with smaller plants postponing for at least another year. Secondary flower stalks may grow from one or more of the side rosettes, but rosettes die off after flowering, with growth resumed from surviving side rosettes.

Trials of plants grown in the Netherlands along a gradient of natural soil fertility from a nutrient-poor location at a brook valley flank down to the streamside habitat dominated by tall herbs showed the greatest plant biomass achieved in a intermediate site (in terms of vegetation density and soil fertility), but with the highest mean water table during the growth period[780]. In the same trials it was found that larvae of the Lychnis moth *Hadena bicruris* consumed the contents of 49.5% of the seed capsules in the various sites (range 23-87%). The moth is recorded in Kent (see accompanying distribution map, which covers 996 sightings), but the records do not map well against *Silene flos-cuculi*, which may in part be due to the locations of trapping facilities, but also because the larvae predate other *Silene* species as well. We have no data on its predation of *Silene flos-cuculi* seed capsules in Kent.



Kent distribution of *Hadena bicruris*, 2010-19,
by kind permission of Karen Hodgson, Kent Moth Group

Silene flos-cuculi is not readily confused with any other species, at least when in flower. So far as concerns its range of variation, we have occasionally encountered white-flowered forms and *The New Atlas of the British and Irish Flora*[781] refers to a dwarf form (var. *congesta*) as having been found in exposed coastal grassland in E. Kent, Caithness, Sutherland and Shetland, and apparently retaining this character in cultivation.

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[780] Biere, A. (1995). Genotypic and plastic variation in plant size: effects on fecundity and allocation patterns in *Lychnis flos-cuculi* along a gradient of natural soil fertility. *Journal of Ecology* **83**: 629-642.

[781] Lusby, P.S. (2002). *Lychnis flos-cuculi* Ragged-Robin. In Preston, C.D., Pearman, D.A. & Dines, T.D. (eds.). *New Atlas of the British & Irish Flora*, Oxford University Press, Oxford.

Cowden.
Photo by David Steere,
27 June 2016.

Hothfield.
Photo by Lliam Rooney, 19 May 2011

Silene gallica L. (Small-flowered Catchfly)

vc 15, gone from vc16

Rarity / scarcity status

Silene gallica is an archaeophyte or ancient introduction, widely but thinly scattered across the British Isles, mostly in east Anglia, south west England and south Wales. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006 and is assessed as **Endangered** (both in England and in Great Britain as a whole), a comparison of English data over the periods 1930-1969 and 1987-1999 having shown that its area of occupancy had declined so that there was a calculated 79% reduction in the likelihood of recording the species. This very steep decline is shared by other classic arable weeds; herbicidal treatment has much to do with this and also the use of fertilisers, given that it favours light, relatively nutrient-poor sandy or gravelly soils. In Kent, however, it has always been **rare**.

Littlestone. Photo by Lliam Rooney, 20 June 2012

Account

The earliest evidence of the Kentish presence of *Silene gallica* is two capsules, calyx and seeds (det. J.R.B. Arthur) found in clay daub from the late 14th century timber-framed building known as Wealden Hall, London Road, Larkfield[782]. The first botanical record, however, is given by Hanbury & Marshall (1899) as attributable to G.E. Smith, published as 'South Kent, G.E. Smith' in H .C. Watson's New Botanist's Guide (1835), in which Watson acknowledges having received a checklist from Smith. The latter wrote in his own interleaved copy of his *A Catalogue of rare or remarkable phaenogamous plants, collected in South Kent* (1829): 'In sandy arable land between the Ridgeway at Brabourne and Kennington'. His notes cover the period 1830-33, so this presumably covers the date of record. Hanbury and Marshall also refer to a specimen in William Borrer's herbarium collected by Smith near Mersham, probably from the same station and presumably on the sands of the Folkestone Formation.

Littlestone. Photo by Lliam Rooney, 20 June 2012

It should, however, be noted that *Silene gallica* var. *quinquevulnera*, a variety in which the pink or red streaks or blotches commonly seen on the petals become a conspicuous solid red (the 'five wounds') was formerly treated as a species, and the first Kent record for this is earlier, in William Hudson's *Flora Anglica*, 2nd edition, 1778: 'Habitat *in arvis arenosis juxta* Wrotham in Cantio' (it grows in sandy fields near Wrotham). Edward Jenner, in his *Flora of Tunbridge Wells* (1845) states in relation to a record in Sussex that it was 'shewn to me by Mr. Maddock, who cannot account for its appearance unless it was introduced with the manure carried up from the town. This most probably was the case at Wrotham and other places where it has been found'. This is possible for manure originating in urban Tunbridge Wells, where var. *quinquevulnera* may have been cultivated as an attractive annual, but it is not so easy to make that assumption as regards Wrotham village; the fields towards Wrotham Heath, on the sands of the Folkestone Formation, would have provided an appropriate native habitat.

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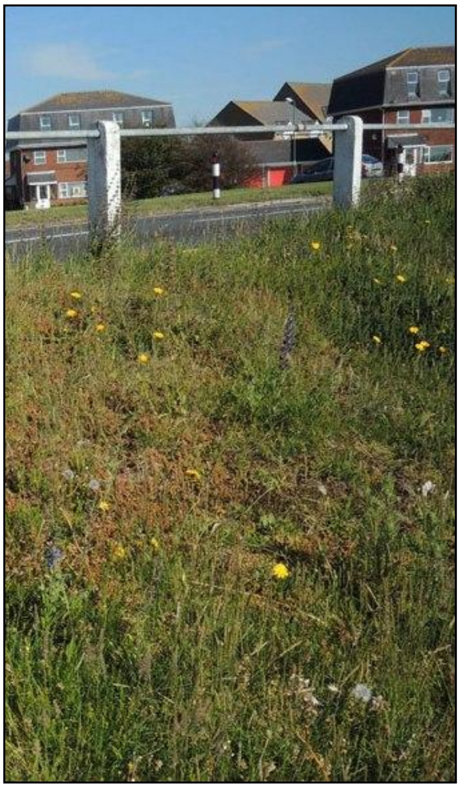
[782] Grove, L.R.A (1964). Archaeological notes from Maidstone Museum. *Archaeologia Cantiana* for 1963, **78**: 188-203.

Hanbury & Marshall (1899) cited only two records for var. *quinquevulnera*, regarded as a casual, and few for ordinary *Silene gallica*, which they treated as a rare colonist or casual of sandy fields. Notably sandy localities were sandy fields near Blackheath (rare, given in Alexander Irvine's *The London Flora*, 1838); Hatch Green near Harbledown (F.M. Webb); and, as *quinquevulnera*, Sandgate (*English Botany*, ed. J.T. Boswell Syme, 1873).

There is little pattern to the 20th century records noted by Francis Rose, who considered the species to be only a casual in Kent. A record by George Talbot (as *quinquevulnera*) near Edenbridge (*B.E.C. Rep*. for 1922) comes without context, but the area is unexpected, being Weald Clay. There are records from near West Wickham in 1926-27, apparently at Spring Park Wood, where there was then more open space, the geology being Harwich Formation and Lambeth Group, both of which may include sand and gravels. Its presence at Hayes is mentioned for 1936-8 (cf. *B.E.C. Rep*. 1937), recorded by David McClintock, and which LNHS records assign to Hayes Old Rectory: David's father was rector there, and it is likely to be an escape from cultivation. A record by Irene Palmer of many plants growing along a road bank at Hayes Common appears unconnected and is the last West Kent (vc16) sighting. Rose collected in 1958 from St Mary's Bay, St Mary Hoo, where there was one plant on a shell-sand beach; and another 1958 record, from near Canterbury, sounds like an escape from cultivation. This last may be the 'casual introduction' to which Philp (1982) refers, as the last record of a species then considered no longer to be found in the county.


Littlestone, habitat. Photo by Geoffrey Kitchener, 20 June 2012

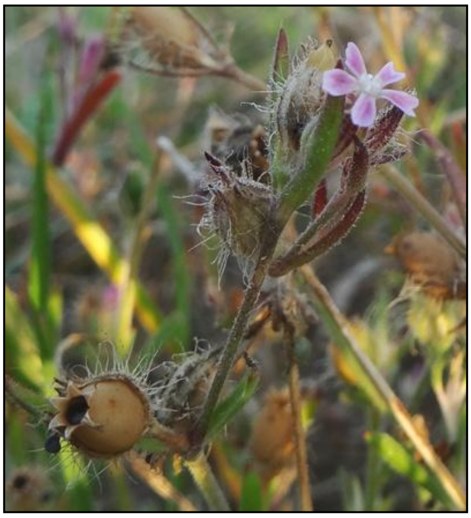
Philp (2010) describes *Silene gallica* as having declined quite seriously in response to modern farming practices and now reduced to a rare casual. This is not perhaps quite accurate as regards Kent, since it was never other than rare here even before changes in farming practices. During the 1990-2005 county survey, a single plant was found on a roadside verge at Gillingham (TQ76Y) and a small colony on disturbed sandy soil at Littlestone (TR02X), which was built over in the 1990s. As regards the latter site, it transpired, however, that the seed had migrated across the road, and on 16 June 2012 a plant was discovered by Owen Leyshon on a sandy roadside bank at Littlestone Greens, opposite Armada Close, TR 08323 24018. The bank had been scarified the previous autumn, and mowing reduced, to encourage *Silene conica* (Sand Catchfly). Associated species were: *Anacamptis pyramidalis* (Pyramidal Orchid), *Cerastium semidecandrum* (Little Mouse-ear), *Echium vulgare* (Viper's-bugloss), *Elymus athericus* (Sea Couch), *Galium verum* (Lady's Bedstraw), *Hypochaeris radicata* (Cat's-ear), *Koeleria macrantha* (Crested Hair-grass), *Plantago lanceolata* (Ribwort Plantain), *Salvia verbenaca* (Wild Clary), *Sedum album* (White Stonecrop) and *Silene conica*. It is interesting that this sandy coastal flora should be so close to what would be expected of *Silene conica* as well as *Silene gallica,* although the latter would more normally be a plant of inland habitats with a different flora range there.

There has been only one other recent native site, a large field bordering Westwell Lane, Tutt Hill, Hothfield, on the sands of the Folkestone Formation where good numbers of *Silene gallica* were found by Stephen Lemon on 13 August 2016 at TQ 975 465, TQ 976 465 and TQ 976 464. A grass crop had been taken and plants were spread along the margin above the High Speed Line with arable weeds such as *Anisantha diandra* (Great Brome) and *Matricaria chamomilla* (Scented Mayweed). This is a significant find, as it would appear to be of the nature of the classic sandy arable occurrences, rather than a casual introduction. Consideration was given as to whether it might have been introduced with the grass crop, but it was confined to one area of the field rather than appearing as a scattered introduction; if it had been sown as part of the High Speed Line construction, it might have been expected on the railway land as well, where it was not seen. But most tellingly, this is an area with a pedigree for rare arable weeds and it appears to be the same field which the Kent Field Club visited in September 1963 (*Kent Field Club Bulletin*, 1964, **9**:34-35), finding *Glebionis segetum* (Corn Marigold), *Misopates orontium* (Weasel's-snout) and *Filago lutescens* (Red-tipped Cudweed); this was probably the last time the cudweed was seen in Kent. The site was visited again on 16 July 2017, with 16 plants found, mostly in fruit, from TQ9735 4672 to TQ9759 4658. On 22 June 2019 there were 13 flowering plants at TQ 975 465, the field having been set to wheat. 14 plants counted, most in flower from TQ 97584 46576 for approx 2 metres south east along arable field edge. It is possible that farming may be modified in future so as to provide a cultivated margin for the benefit of the species.

Presence 2021-23 on an arable margin near Adisham appears to have originated from seed contamination in the course of the deliberate introduction of *Galeopsis angustifolia* (Red Hemp-nettle).

Tutt Hill, habitat. Photo by Stephen Lemon, 13 August 2016

Silene gallica germinates primarily in autumn, but seedlings may get killed off in winter as seedlings intolerant of temperatures of -10°C.[783] It sets a mean of 48 seeds per capsule, and given that the seeds do not seem adapted for transport by wind or animals, it is likely that these fall close to the plant (subject to any potential for the dried plant itself to be carried away from its site) and it would not be particularly efficient in its seed dispersal. The disadvantage of this might be offset if seed viability is long-lived, but there does not seem to be any available information. After germination, plants form a rosette persisting through winter in the case of autumn germination; a single erect stem elongates in early to mid-summer, then branching to flower from mid-June to August. It may be regarded as a stress-tolerant ruderal, typically growing in nutrient-poor soil where there is limited competition, from crops or otherwise.[784]



Tutt Hill. Photo by Stephen Lemon, 13 August 2016

Silene gallica, it has been said, might be taken for an abnormally small *Silene latifolia* (White Campion) or *Silene noctiflora* (Night-flowering Catchfly), but is indeed far smaller than could be expected for those species. Its calyx lines are not as numerous as those of *Silene conica* (Sand Catchfly) and might be taken for a *Cerastium*-like species at a casual glance. The illustrations in this account show flowers with differing appearances, that from Littlestone being white, and that from Tutt Hill having slightly wider petals, pink with blotches of deeper colour, but not blood-red as with var. *quinquevulnera*.

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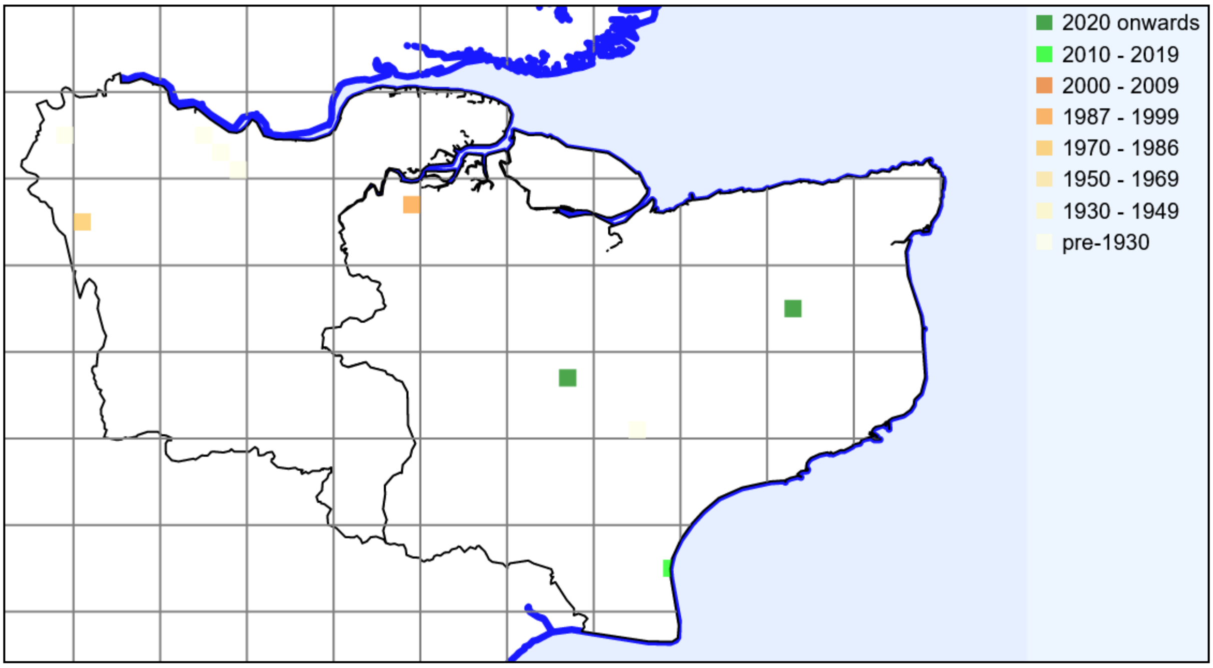
[783] Smith, A. (1994) *Silene gallica* L. Small-flowered catchfly. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough.

[784] Wilson, P.J. (2005). *Silene gallica* (L.), Plantlife dossier, https://www.plantlife.org.uk/application/files/4114/7913/4089/Silene_gallica__dossier.pdf

This last variety was generally treated as a species (named as such by Linnaeus) by British botanists until 1937, when a note by Ted Lousley[785] was published suggesting that *Silene gallica* for British plants be treated as divisible into var. *sylvestris* (otherwise, var. *gallica*, Channel Islands), var. *anglica* with dingy white (commonest in east and south east England), yellowish or pale pink petals (extending to pale purple in the south west) and var *quinquevulnera*, although 'many intermediates and minor variations occur, and ...extreme examples are not always to be found'. The Littlestone and Tutt Hill forms appear to be at different ends of the spectrum of variation of var. *anglica*, the latter tending towards the *quinquevulnera* end, but still within var. *anglica*. It is not impossible that some of the early Kent records for var. *quinquevulnera* were instead within the var. *anglica* spectrum.

Silene gallica **Kent records to 2024 mapped at tetrad level, from BSBI database.**



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[785] Lousley, J.E. (1937) *Silene gallica* L., *B.E.C. Report for 1936*, **9**:395-6.

Silene noctiflora L. (Night-flowering Catchfly)

vc 15 and 16

Rarity / scarcity status

Silene noctiflora is an archaeophyte or ancient introduction of cultivated land, formerly widespread over the British Isles but now much reduced and considered to be **Vulnerable** to the risk of extinction in England and in Great Britain as a whole. A comparison over the periods 1930-1969 and 1987-1999 showed that its overall English range had reduced by 52% and its area of occupancy had declined so that there was a calculated 57% reduction in the likelihood of recording the species. This would normally qualify such a species to be treated as Endangered rather than Vulnerable, but since 1999 there have been some signs of national recovery. The decline is generally attributed to increased use of herbicides since the 1950s and a move towards autumn-sown crops; recovery appears to be an effect of agri-environmental schemes. From 1971-80 to 1991-2005 the decline in Kent appeared catastrophic, dropping to a single site, but since then more locations have been found, and it is no longer rare, but verging on scarcity. It is a Kent axiophyte and so is indicative of good habitat.

St. Margaret's at Cliffe. Photo by Lliam Rooney, 17 July 2013

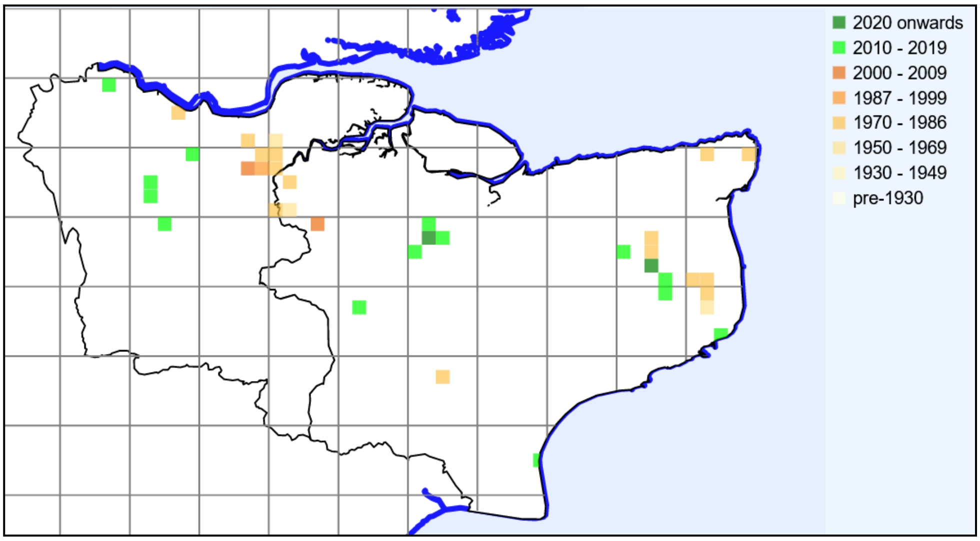
Account

The first published Kent record for *Silene noctiflora* is given by Hanbury & Marshall (1829) as that of G.E. Smith in his *Catalogue of rare or remarkable phaenogamous plants collected in south Kent* (1829); 'in Corn-fields upon the chalk' (Smith added against this in his own copy of the book, 'principally about Ramsgate', and Dumpton Gap is mentioned later in his book). However, this is surprisingly late, and Francis Rose considered that Thomas Johnson's note of *Lychnis silvestris parva* in his *Descriptio Itineris* (1632) should be interpreted as this species. Johnson recorded it after listing three species of sandy arable land (*Spergula arvensis*, *Spergularia rubra* and *Ranuculus arvensis*): it looks as though Johnson had at least got as far as Ash en route to Canterbury from Sandwich, so he may have been on the sands of the Thanet Formation between Ash and Wingham, or have reached Littlebourne. In the same expedition Johnson found *Silene dioica*, *S. latifolia* and *S. vulgaris*, all of which he named differently, so it cannot be any of these, and *S. noctiflora* seems quite plausible.

Hanbury & Marshall (1899) considered it to be a rare colonist or casual of fields and waste ground, giving only seven or eight records, which included both sandy and chalky locations. Francis Rose described the species as rare but widely distributed, mainly in East Kent, in cornfields on chalk and sand. In West Kent, records cited in his manuscript *Flora of Kent* included a few in the north west, e.g. a cornfield near Darrick Wood, TQ 454 649 (1959; this is now established chalk grassland); field east of Claylane Wood, Cobham, TQ 667 704 (this is in the path of the proposed Lower Thames Crossing); an arable field on chalk, north of Lower Bush, Cuxton (1952; now in or near Ranscombe Farm reserve). In East Kent, it was widely scattered on the Downs dip slopes: e.g. in cornfields south of Eastry, east of Knowlton on chalk (1958), Sutton Downs (TR 330 480; 1958), Tilmanstone (probably TR3150; 1959) and north of Dover (1944). Also, there were a number of records in Thanet in addition to G.E. Smith's mentioned above, including a chalky arable field at Joss Bay / North Foreland (1954), cornfields in Quex Park, where plentiful (1950), a cornfield on chalk north west of Plumstone Farm, Monkton (1958), and (presumably close by) a cornfield west of Cleve Court, Minster (1963).

A very broadly similar distribution is shown by the records in Philp (1982): 14 tetrads mostly focused on the hinterlands of Deal and Dover, the chalk of Thanet and around Cuxton.

The subsequent recording history is a little surprising. Philp(2010) noted only one 1990-2005 record, at Cuxton (TQ66Y), which indicates at least some continuity in that area; but the absence elsewhere, attributed to changes in farming methods, must in part be an artifact of recording, in view of finds by others then, as well as during the period 2010-23.



***Silene noctiflora* Kent records to 2024 mapped at tetrad level, from BSBI database.**

By contrast, our 2010-24 records amount to 16 tetrads (monads were the same). They continue to include some plants in the Deal / Dover hinterlands (but mostly different sites from those in 1971-80); there is none in Thanet; a cluster has been found in TQ95 (Doddington / Wichling); and there appears to be a cluster in TQ56 (although this is due to a large colony at Lullingstone, in a single field spanning a tetrad boundary). So a lack of overall decline is masking a situation which is not straightforward to interpret, but may be due to a long-lived and still fairly widespread seed-bank producing plants only where accidents of cultivation (or lack of it) permit.

Records show *Silene noctiflora* as largely restricted to the chalk. Exceptions in the 2010-23 records are a plant on consolidated shingle on a vacant plot at Littlestone; plants at Great Tong Farm, Headcorn, on Weald Clay which had been sown deliberately (the flowers appeared unusually yellow, which might suggest non-native provenance); and a plant in a border at Lesnes Abbey, on sands of the Thanet Formation. Seed is available commercially for growing as a ‘wildflower’, advertised as attracting moths, which is probably misguided.

St. Margaret’s at Cliffe. Photo by Lliam Rooney, 17 July 2013

Silene noctiflora is an annual, germinating mainly in spring and developing best in crops sown towards the end of March; its late flowering (normally given as from July, although some of our recent records are in June) means that seed production is most effective when crops are harvested in autumn or winter (as with sugar beet) or stubble is left after harvest.[786] Most of our recent records are, however, from arable margins which may afford longer opportunities for growth than the cropped field. But at Lullingtone, where an estimated 1,000 plants were seen in stubble in 2010, the seed-bank appears to be well within the field and plants do not reach the margins. Coupled with the tendency here to apply herbicide shortly after harvesting so that, in the case of cereal crops, the stubble does not provide a growth opportunity for long, *Silene noctiflora* is now seldom seen at this site, despite the seed-bank.

Seed production is a mean of 182 ± 3 seeds per capsule and just over 2,500 per plant.[787] The species is mostly hermaphroditic but can have both female and hermaphrodite flowers on the same plant; the hermaphrodite flowers are of two types, with anthers either protruding from, or fully enclosed in the calyx tube. It is often stated that the species, having pale flowers (white to light pink above, yellowish below) with sweet fragrance which open at dusk, is pollinated by night-flying moths. It may indeed have evolved on this basis, but in the course of German studies night-active moths were never observed. The studied population also showed pseudocleistogamy, with most hermaphrodite flowers self-pollinating in bud, partly followed by flower opening, but seed ripening started immediately after seed-set at bud stage. Accordingly, the plants were mostly independent of pollinators because flowers set nearly 100% seed with only a few bumblebees occasionally visiting.[788] Breeding patterns of *Silene* species are complex and variable, and have attracted much study for their ecological and evolutionary significance. *Silene noctiflora* has one of the largest known mitochondrial genomes and this seems to bring unusually high evolutionary rates[789]. Assuming that the Central European experience of selfing applies widely, one can only speculate as regards whether evolution away from moth pollination dependence has been to assure reproduction where pollinators have been scarce, or to avoid moth predation, or for some other cause.

Any identification issues are likely to be as between *Silene noctiflora* and *Silene latifolia* (White Campion), both of which can grow in the same habitats. Their leaves and general appearance can be very similar. They can be separated by the number of styles (3, sometimes 2, in *S. noctiflora*; 5 in *S. latifolia*, where present – male plants will not have them). Also relevant are the capsule teeth (6, more or less recurved in *S. noctiflora*; 10, ranging from sub-erect to patent in *S. latifolia*). The petals of *S. noctiflora* are noticeably narrower, but are inrolled during the day. The calyx is 10-veined in *S. noctiflora*; this applies also to male flowers of *S. latifolia*, but female flowers have 20-veined calyces.

The following table for post-1970 records omits those in Philp(1982) which are all included in the 1970-86 distribution map above and do not have detail beyond the tetrad location.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Lesnes Abbey (metropolitan vc16)	TQ4778		19 August 2017	RMB (LNHS meeting)	One plant in flower bed, TQ 4786 7879.
Lullingstone Park	TQ5263, TQ5264		(1) 20 August 2019 (2) 13 September 2010 (3) 6 September 1993 (4) 10 August 1990 (5) 5 November 1989	(1) –(5) GK	(1) TQ 5250 6398. One plant in stubble of cereal crop, further exploration of area not undertaken. (2) Large colony in arable stubble of Lullingstone Park extending from TQ 52542 63945 to TQ 52595 64065, est. total of 1000 over TQ5263 and 5264. (3) 80 plants in stubble.

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[786] Smith , A. (1994). *Silene noctiflora* L. Night-flowering catchfly. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain*, JNCC, Peterborough.

[787] Salisbury, E. (1961) *Weeds and Aliens*, Collins (New Naturalist), London.

[788] Jurgen, A., Witt, T. & Gottsberger, G. (1996). Reproduction and pollination in Central European populations of *Silene* and *Saponaria* species. *Botanica acta; Berichte der Deutschen Botanischen Gesellschaft* **109**: 316-324.

[789] Williams, A M. et al. (2020). Long-read transcriptome and other genomic resources for the angiosperm Silene noctiflora. bioRxiv.

					(4) Cornfield stubble, chalky ground. (5) TQ5264 etc. (two tetrads). 82 plants in stubble of cornfield on slope between 175’ and 200’ contours. [After 2010, farming methods appear to have been adverse, with post-harvest spraying and early tillage. No plants at all were seen on survey of the stubble on 11 September 2024, with weed flora generally poor or absent.]
Stone	TQ57S		1974	JRP	Sandpit.
West of Longfield	TQ5968		23 June 2012	GK	One plant at margin of barley field, TQ 59182 68779.
Luddesdown	TQ6666		30 August 2009	GK	TQ 66647 66568, one plant in arable on chalk slope by footpath.
West of Cuxton	TQ66Y		1991-99	EGP	
Cuxton Fields	TQ6968		25 August 1985	JP	One plant.
[Great Tong Farm]	[TQ8546]		[5 June 2014]	[GK]	[Many large plants on bare soil by track just north east of Great Tong Farm, sown by farmer; looked yellower than other Kentish plants seen.]
South west of Wichling	TQ9055		(1) 30 June 2018 (2)28 June 2017 (3) 22 October 2016	(1) –(3) DC	(1) TQ 90368 55390, c.100 plants on set aside strip as in previous years. (2) TQ 90404 55527, same place as previous year, but flowering much earlier. (3) TQ 904 555, Syndale valley, several plants amongst margin of arable with *Chaenorhinum minus*.
Doddington, south west	TQ9256		17 June 2020	RM	TQ 92601 56129, several plants already flowering. This location has long been a spot where garden plants get dumped, other plants nearby include *Mimulus guttatus* and *Silene coronaria*, so recorder queries origins.
Doddington, north	TQ9258		15 August 2015	KFC meeting	TQ 93212 58968 c.30 plants, margin of cornfield on sandy clay with *Stachys arvensis*.
Doddington, east	TQ9457		15 September 2013	RM	Several plants at TQ 9432 5712, arable margin on chalk.
Littlestone	TR0824		21 June 2015	TI	On a vacant plot at Littlestone, TR 08379 24313, Grand Parade / Queen's Road.
Adisham Court west	TR2154		12 August 2019	AM	Colour in the Margins project Plantlife/RSPB, a dozen or so plants in cultivated field margin.
South of Tilmanstone	TQ2457		23 July 1986	RoF, AS	TR 249 572, arable weed survey.
Nonington	TQ2552		24 June 2021	SB	Large broad bean field, a single plant at TR 25895 52630 at the edge of the bean crop and within an area sown for birdseed with sweet corn, etc.
Barfrestone	TR2650		(1) 24 June 2019 (2) 31 July 2013	(1) AM (2) SB	(1) Colour in the Margins project Plantlife/RSPB survey. (2) Many thousands of plants in set-aside area 40 x 50m at TR 262 508, arable headland under high level stewardship scheme.
St Margaret’s at Cliffe	TR3543		17 July 2013	KBRG meeting	National Trust arable reversion, a single plant at TR 35862 43206.

Silene nutans L. (Nottingham Catchfly)

vc 15; casual, briefly, in vc16

Rarity / scarcity status

Silene nutans is a plant of dry grassy or bare places, generally coastal but with some inland limestone locations, and is known (other than as a casual) from the English south coast and as far north as North Wales and the Peak District. In England it is considered **Near Threatened**, the extent of its occupancy in England having declined by 26% in comparing data from 1930-60 and 1987-99 respectively. It is **nationally scarce**, but is well established on the east Kent coast, so that it is neither rare nor scarce within the county, although its Kent populations are of national significance. It is a Kent axiophyte and so is indicative of good habitat.

Account

Nottingham Catchfly is so named from having its first generally recognised British record from the walls of Nottingham Castle (1670: John Ray's *Catalogus Plantarum Angliae*). But there is the possibility that this is anticipated by Christopher Merrett's 1666 citation (in *Pinax Rerum Naturalium Britannicarum*) of '*Behen* flore albo elegantiori, three miles from *Dover*, in the way to *Rye*, on the Beach, all along betwixt *Hide* and *Rumney*'. Druce gave this reference, but it was ignored by Hanbury & Marshall (1899); and David Pearman (*The Discovery of the Native Flora of Britain & Ireland*, 2017) mentions it, but does not commit as to whether this was intended for *Silene nutans*. Hanbury & Marshall (1899) gave the first Kent record as in John Ray's *Synopsis Methodica Stirpium Britannicarum* (1690): 'Lychnis major noctiflora Dubrensis perennis…*Great night-flowering Campion* of Dover-*Cliffs*. Found by Mr. Newton'. However, this was preceded by Ray's *Fasciculus Stirpium Britannicarum post editum Plantarum Angliae Catalogum Observatarum* (1688) ('*The greater perenniall night-flowering Campion. Upon* Dover *Castle Cliffs*.') and by his *Historiae Plantarum* (vol. 2) of the same year in which a full description is given.

Long Pits, Dungeness. Photo by David Steere,
15 June 2016

Hanbury & Marshall (1899) referred to *Silene nutans* as being locally abundant on downs, chalk clffs, etc. and gave records from the cliffs from Kingsdown to St. Margaret's and thence to Dover, Eastwear Bay and on Sandgate Castle. The Dover colonies were very well known, the more so for being popularised in *The Flowering Plants and Ferns of Great Britain* (1855) by Anne Pratt, a Dover resident 1849-66:

> 'On portions of the sides of those towering and majestic cliffs which border the shore for several miles along the east of Dover, as well as at some parts of the cliffs standing to the west of the town, thousands of the pretty white starry blossoms of the Catchfly may be seen in the evening, growing on stems about a foot high. Nor do these flowers wait, as some night flowers do, for darkness ere they expand; for the author has seen them in their full glory by eight o'clock, before the soft twilight has thrown its subdued shadow over the summit of the cliffs'.

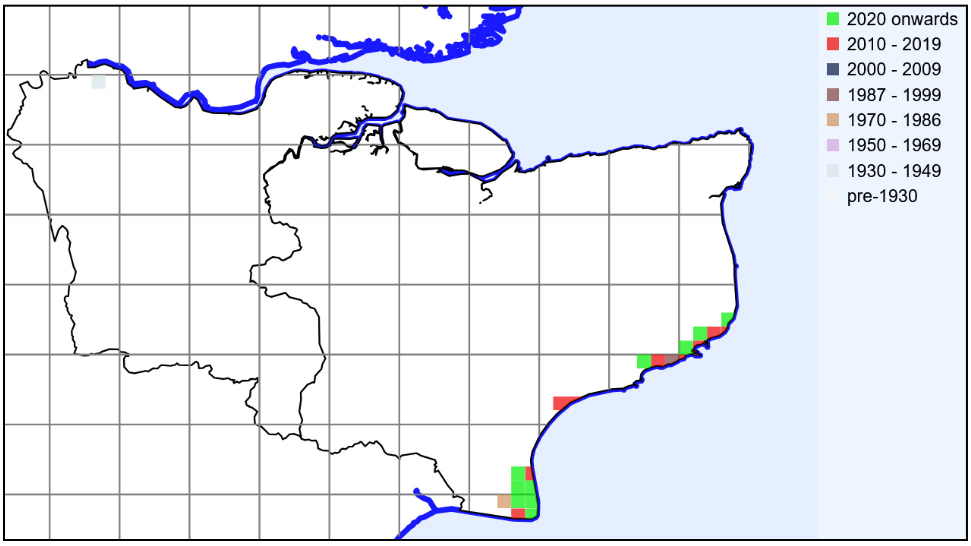
There is something about the species which attracted lyricism in 19th century botanists. G.E. Smith wrote in 1829:

> ‘Silene nutans is not abundant in open situations; upon Shorne Cliff in several spots frequented by cattle it may be collected; but no where does it flourish so well as upon the brow of the once rude, now tufted and glowing, heights of Encombe [near Sandgate]. The plant is humble, without grace, and uses no display; when night has hidden the glories of the garden, it expands its narrow petals and fills the whole air and every breeze with most delicious fragrance. What, in darkness, the distant glimmering lamp, the glow-worm, the fire-fly, are to the eye; what in still night, the sound of distant bells, of soft music, of flowing waters, is to the ear; what in night’s solitude the lip of a friend is, to the sense of perception and touch, are flowers and fragrances, …the Catchfly to the sense of smelling: when the flowers of the day are faded, and stillness and secret influence of night render sense, as well as imagination, more vivid and susceptible of agreeable, as well as more acutely impatient and conscious of displeasing or discordant, impressions’.

Turning to the other main Kent locality for the species, Hanbury & Marshall (1899) referred to George Dowker’s observations of several specimens on the Dungeness shingle beach noted on an excursion from Appledore Station to Dungeness Point (*East Kent Natural History Society Report* (1867) 28-34). Marshall also found the species plentifully there in 1890, but recorded it wrongly as *Silene italica* (Italian Catchfly).

Dover cliffs. Photo by Lliam Rooney, 20 May 2009

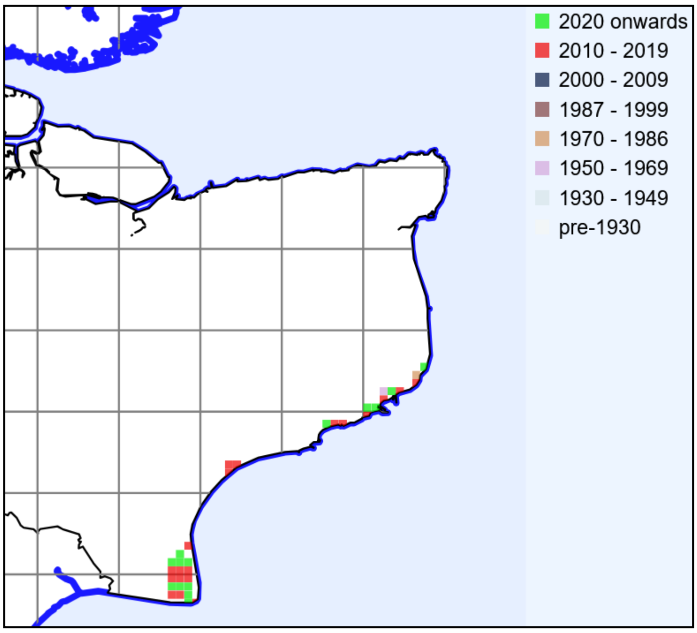
These two areas, Dungeness and Kingsdown to Sandgate have remained the focus of distribution since. Francis Rose in his manuscript *Flora of Kent* described it as present at ’Dungeness beach, from near Greatstone and just west of the lighthouse inland to Boulderwall and S. of Lydd: not on the newest shingle where there is no turf or soil. It is very abundant over several square miles, associated with *Teucrium scorodonia*, *Jasione*, *Festuca ovina* ssp. *tenuifolia*, *Sedum anglicum*, *Dicranum scoparium* and *Cladonia* spp.’ Further north east, he noted a 1957 record from old shingle at Willow Tree Farm, Hythe (this has since been developed as a residential park; but we have recent records from nearby Hythe Ranges). Then yet further north east, he referred to it as ‘Abundant on the chalk cliffs, and on the short turf on top within a few yards of their edges, from Folkestone Warren to Dover West Cliff, and from Dover East Cliff to just S. of Oldstairs Bay, Kingsdown, more or less continuously.’



Silene nutans **Kent records to 2024 mapped at tetrad level, from BSBI database.**

This distribution is fairly represented by the 1971-80 county survey in Philp (1982), which gave records for 18 tetrads, on shingle and chalk cliffs and downs. In the 1991-2005 survey in Philp (2010), it is described as still well established in those areas, but with a tetrad total of 14.

One should not read any decline into this: the 2010-24 records amount to 19 tetrads (33 monads), so that if it were to be re-found at, say, Round Down, Dover (TR23Z), which would seem possible, then would be a gain over the 1970-82 total (although this is probably just a matter of recording, and we have county populations which have had fairly constant distribution over the years).



Silene nutans **Kent records to 2024 mapped at monad level, from BSBI database.**

Additional mapping is given here at monad level to show finer resolution; historic records largely do not appear, as monad recording only became the norm in Kent from 2010.

Dungeness. Photo by Lliam Rooney, 27 June 2012

Our recent records emphasise the vast numbers of plants growing on the stabilised shingle at Dungeness, generally in vegetated areas but sometimes accompanied by very little else. At Lydd Ranges it has also been seen as widespread, although potentially under threat from MOD vehicles. On cliff tops, it has been noted as growing on grassy slopes, and also as a chasmophyte on a shaded vertical cliff face. An unexpected habitat was along the centre reservation of the A20 dual carriageway near East Wear Bay TR268 389 (Steve Coates, 2017), although there is an old record for the roadside of the A20 east of Willesborough.

Photo by Lliam Rooney, 20 June 2012

Its requirements are generally for shallow, well-drained soils which may be acidic (as at the Dungeness shingle, although at times there is little that one could call soil) or calcareous (at the chalk cliffs). It is apparently one of the species which spread in post-glacial times to occupy open areas with thin soil and generally now only survives in sites with analogous conditions[790], although capable of tolerating some shade. Associated species at Dungeness include: *Aira praecox*, *Anthoxanthum odoratum*, *Digitalis purpurea*, *Rumex acetosella*, *Sedum anglicum*, *Silene maritima*, *Teucrium scorodonia*.

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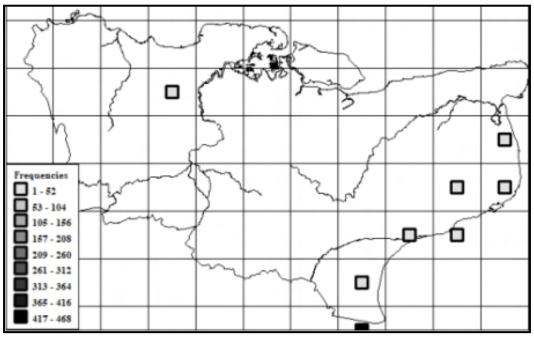
[790] *Silene nutans* L. Nottingham Catchfly. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. (1994) Scarce Plants in Britain.JNCC, Peterborough.

Associated species at an exposed cliff edge community at St. Margaret's Bay include: *Achillea millefolium*, *Anthyllis vulneraria*, *Beta vulgaris* subsp. *maritima*, *Brachypodium sylvaticum*, '*Bromus mollis* agg.', *Catapodium rigidum*, *Dactylis glomerata*, *Festuca rubra*, *Galium album*, *Pilosella officinalis, Plantago coronopus*, *Plantago lanceolata*, *Poterium sanguisorba*.[791]

It is a long-lived perennial, spreading by seed and rhizomes, as well as being capable of rooting from fallen stems. The flowers, which may be female or (more usually) hermaphrodite, can last for three days in sheltered conditions, opening in the evening and emitting fragrance, which suggests availability for night-flying moth pollination (although *Silene noctiflora* appears similarly adapted, but does not have moth visitors). It seems that *Silene nutans* does receive moth visitors and also other insects, including day-flying Bombus species.[792]

Dover, White Cliffs. Photo by David Steere, 7 May 2016

Parasitism by *Cuscuta epithymum* (Dodder) has been observed (2014 and 2017) widely on the Dungeness shingle. *Silene nutans* also receives attention from the moth *Hadena albimacula* (White Spot), a Red Data Book species whose larvae feed only on its seeds and seed-capsules. The moth distribution is a little wider than that of *Silene nutans*, but is known to breed at Dungeness (supposedly the largest population in the country), Hythe Ranges and Samphire Hoe.



Kent distribution of *Hadena albimacula* by kind permission of Karen Hodgson, Kent Moth Group

Silene nutans is reasonably distinct from other British *Silene* species which may normally be encountered, with its delicately-flowered, drooping, lax inflorescence. However, it has in the past been confused with *Silene paradoxa*, a Mediterranean species, and *Silene italica* (in Kent, only present at Mounts Road, Greenhithe: it has a calyx exceeding 13mm; that of *S. nutans* is less).

It is a very variable species, including as to flower colour, leaf shape, hairiness and capsule size. Botanists have over the years compared the Kent plants with other populations, e.g. John Stuart Mill in the *Phytologist* of 1861 remarked on the Dover variety on the cliff at St. Margaret's being a very coarse, large and rough-leaved form, differing from the delicate form at Nottingham Castle and also from that on the Isle of Wight. Hepper (1951)[793] considered that the species could be regarded as divided into two varieties, var. *salmoniana* and var. *smithiana*. The former was the plant of Dungeness, Lydd, Hythe and Sandgate[794]. The latter variety could be regarded as having six forms of which one comprised the other East Kent colonies, in particular that at Kingsdown. Recording such variants has fallen out of use, although Sell & Murrell (2018)[795] give them: var.

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[791] Silene nutans L. (Biological Flora of the British Isles) (1956) *Journal of Ecology* **44**: 693-700.

[792] Stroh, P.A. 2015. Silene nutans L. Nottingham Catchfly. Species Account. Botanical Society of Britain and Ireland.

[793] Hepper, F.N. (1951). The variations of Silene nutans L. in Great Britain, *Watsonia* **2:** 80-90.

[794] It is also stated to be a West Kent plant, but there are no native colonies there, and it may that this is an allusion to a casual found on a bank at Lesnes Abbey in 1948.

[795] Sell, P. & Murrell, G. (2018). *Flora of Great Britain and Ireland*, vol.1. Cambridge University Press, Cambridge.

salmoniana having narrow and sparsely hairy leaves, carpophores 3-4mm and capsules 11-14mm; var. *smithiana* having broader and more hairy leaves, carpophores 2-3mm and capsules 8-10mm.

Sium latifolium L. Greater Water-parsnip

vc 15; long gone from vc16

Rarity / *scarcity status*

Sium latifolium is a plant of fens and ditches, largely reduced after substantial decline to south-east and east England together with central Ireland. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006, and classified in both England and Great Britain as a whole as **Endangered**, and so at very high risk of extinction in the wild. This risk assessment is based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison for England over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 77% and its area of occupancy had declined so that there was a calculated 60% reduction in the likelihood of recording the species. In Kent, there is possible evidence of decline, a 36% reduction in tetrad records between 1971-80 and 1991-2005, but these figures may in part be an artifact of recording. It is **nationally scarce** and in Kent it verges upon being scarce and is very local. It is a Kent axiophyte and so is indicative of good habitat.

Bilsington. Photo by Owen Leyshon, 23 July 2019

Account

The first supposedly Kentish record for *Sium latifolium* is stated by Hanbury & Marshall (1899) as being around 1700, a record of *Sium majus latifolium* in the ditches between Redriff and Deptford given in manuscript notes of the collection of Samuel Doody in the Sloane herbarium. This must be the same as that given by Dillenius in the third edition of John Ray's *Synopsis Methodica Stirpium Britannicarum* (1724): 'In the Ditches between *Rotherhithe* and *Deptford*. *Mr. Doody*'. It must be doubtful, however, that this was actually in Kent: most of the land between Deptford and Rotherhithe (Redriff) was in Surrey. The first unambiguously Kentish record, therefore, was at Faversham by Edward Jacob (*Plantae Favershamienses*, 1777): '*In marshy Ground, and by the River side – common*'. This continued in marsh dikes at least until the time of the Rev. H.A. Stowell, who found it to be more frequent than *Berula erecta* (Lesser Water-parsnip)[796]; it is surprising that it seems to have gone since.

But this seems to have been the fate of all Kent sites (ditches in marshes by the Thames from Deptford to Gravesend, by the Ravensbourne and River Cray, the Stour above Canterbury, Willesborough and (if correct) Tonbridge) – except for Romney Marsh and the Rother catchment. The last of the now-extinct sites was the ditches by the railway south of South Willesborough, TR 017 403, where found by Francis Rose in 1950, but not seen since c.1960, after which the area changed, even more so recently.

The Dowells. Photo by Lliam Rooney, 27 June 2012

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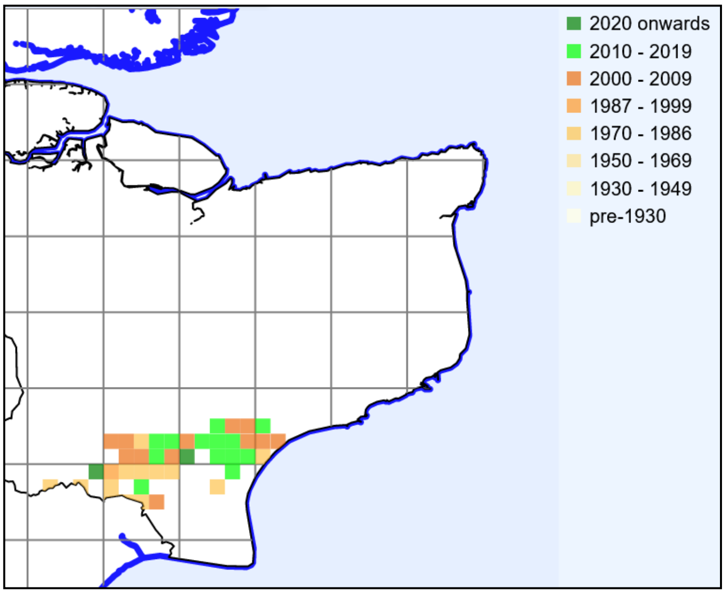
[796] Stowell, Rev. H.A. (1857). Faversham Plants, *The Phytologist* **2**: 100. It is as well that he also mentioned *Berula erecta*, and so distinguished the two species, given that early botanists sometimes confused them; it is surprising that, given its present-day frequency, Jacob did not record *Berula*.

Hanbury & Marshall (1899) regarded the species as very local in ditches and marshes, and decreasing. They noted it as extinct in most, if not all, of the north west Kent localities. The most recent records made by, or reported to, them were at Romney Marsh (e.g. Frederick Hanbury noted it as abundant in trenches by the road between Hamstreet and Ivychurch) and nearby (e.g. the Bottoms, Tenterden, noted by J.G. Prebble); also a surprising one (if correct) at Cranbrook. Francis Rose described it as a native of 'marsh dikes; rare and very local; at the present day [c.1960] nearly confined to Romney Marsh and its adjacent alluvial levels…where, however, it is still widespread, frequent and locally plentiful'. He produced a list of 23 sites (of which one may be a duplicate) for the period 1945-65. This is close, in terms of overall cover, to the total of 25 tetrads listed in Philp (1982) for 1971-80.

From The Dowells. Photo by Lliam Rooney, 17 July 2015

However, Philp (2010) gave only 14 tetrad records for 1991-2005, stating that in spite of some conservation measures, this plant still seems to be in decline. One should not rely too much upon a comparison between those two surveys. The 1991-2005 data in fact only included Eric Philp's finds during 1991-99. In 2000 a targeted survey was carried out by Peter Wells on behalf of the Romney Marsh Countryside Project[797], as a result of which there are 94 records listed in the BSBI database for 2000, found in 20 tetrads (32 monads, although the individual records were made as six, eight or ten figure grid-references and input to the BSBI at six figures). The survey report is considered further below.

Our more recent records, for 2010-24, covered 15 tetrads (21 monads), which could be interpreted as indicating decline, although no different in total for the Philp (2010) figures. But it is probably better to view this as the product of a general survey, which would not be expected to be as thorough as the targeted 2000 survey. It is concluded that there appears to have been some decline since 1971-80, but it is not readily quantified and is certainly not as much as suggested by Philp (2010). In view of the overall quantity of records, this register account treats them as mapped, rather than in tabular form.



***Sium latifolium* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Records as a whole are not related to the present-day coast, but follow more closely the ditches spreading across the land under the high ground which was the coastline in Roman times. As *Sium latifolium* is not normally a plant of brackish waters, any increased brackishness would presumably discourage its spread nearer the present coastline.

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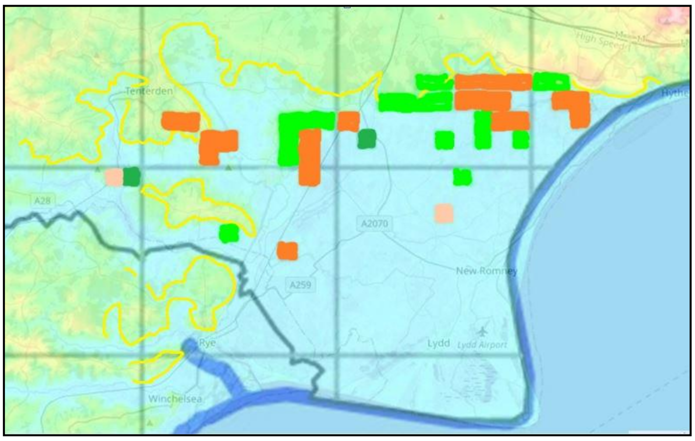
[797] Wells, P. (*December 2000).* A survey to determine the abundance and distribution of Greater Water Parsnip *Sium latifolium* in the Romney Marsh Natural Area. Unpublished report prepared for the Romney Marsh Countryside Project, based on a survey commissioned by (then) English Nature.



***Sium latifolium* distribution (in monads) to 2024, from BSBI database, with topographical overlay . This shows much greater precision than the preceding map, but at the expense of omitting older records as relatively few pre-2000 sightings are recorded at monad level). Note the clustering below high ground.**

As *Sium latifolium* is not normally a plant of brackish waters, any increased brackishness would presumably discourage its spread nearer the present coastline. It is possible that its origins lay with parts of the Roman coastline which were low enough to provide flattish land with freshwater drainage, and also with the levels associated with the Rother catchment, where peat formation in fen carr was taking place c.6250 to c.3600 BP[798] (the carr itself would have been too shaded for *Sium*, but any open areas may have held the species). The history of changes in land levels, drainage and marine transgression is quite complex in this area, but the Walland Marsh, from which *Sium* appears absent, was more recently reclaimed than Romney Marsh proper, which includes *Sium* habitat and has much less residual brackish influence.

The 2000 survey found a minimum of 2,017 plants recorded at 128 locations. Healthy populations were found in a broad corridor from West Hythe westwards to Appledore, with locations north and south of the Royal Military Canal; there were clusters at Warehorne, Bilsington, Burmarsh and also on Shirley Moor. In 2001, survey was extended to the Rother Levels adjacent to Romney Marsh and a further 99 plants were recorded at nine sites. Additional finds followed, including in 2006, when six sites containing 61 plants were noted on the levels east of Smallhythe, so that for the period 2000-2006 a total of 2,369 *Sium* plants were found in Kent at 146 sites (and 142 in seven sites in Sussex, where the Rother Levels also extend).

The number of plants found at individual locations varied considerably. Whilst 75% of the reported colonies in the 2000 survey consisted of five or less plants, 5% of the colonies consisted of more than 50 specimens. The survey also highlighted that clusters of 100 plants were found at six localities, accounting for 80% of the plants recorded in that survey.

The natural habitat of *Sium latifolium* is the very wet, species-rich, tall-herb community that develops as a semi-floating raft at the edges of lakes and large rivers, but loss of this habitat in Britain has left the species most frequently growing in drainage ditches. *Sium latifolium* prefers shallow, still or slow-moving waters which are alkaline, nitrogen-rich and on a peaty or alluvial soil. Plants are long-lived and can survive in tall stands of *Phragmites australis* (Common Reed) for over ten years and can also live for some years submerged. Mountford (1994)[799] considered that the species is most common in ditches which do not adjoin pasture, as it is intolerant of grazing and frequent cutting; ditch management by occasional cutting, however, may help in keeping water open, and unless there is ditch clearance at some stage, the opportunities for establishment of seedlings may be limited. The issue of land use adjoining ditches is not straightforward, however: Williams *et al.* (2000)[800] found that *Sium latifolium* was restricted to a relatively small number of freshwater ditches and these tended to be in pasture, despite conversion to arable in Walland Marsh being likely to have focused on better-drained, less low-lying fresh water areas, leaving more saline areas as pasture.

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[798] Long, D., Waller, M. & McCarthy, P. (1998). The Vegetation History of the Lower Rother Valley: Stratigraphy and Pollen Data for the Shirley Moor Region. In (eds.) Eddison, J., Gardiner, M. & Long, A.) *Romney Marsh: Environmental Change and Human Occupation in a Coastal Lowland*, OUCA Monograph **46**: 31-44. Pollen data summarised here does not mention *Sium latifolium*: all Apiaceae pollen was undifferentiated.

[799] Mountford, J.O. (1994). *Sium latifolium* L. Greater water-parsnip. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. , *Scarce plants in Britain*, JNCC, Peterborough.

[800] Williams, R., Banks, B., *Sonchus palustris* Cameron, R. & Cooke, R. (2000). *Ditch monitoring at Walland Marsh SSSI 1993/4*. English Nature Research Report 132.

Burmarsh. Photo by Sue Buckingham, 6 August 2013

The 2000 survey showed that ditch management has a major impact on the plant and the plant was uncommon in the larger ditches managed annually by the water bodies (Environment Agency and the Romney Marsh Internal Drainage Board). It was seen in these frequently maintained ditches that the plant survived in awkward corners and under bankside bushes, usually *Crataegus monogyna* (Hawthorn), which a reed cutting machine could not reach. Ditches near footbridges or culverts were also frequent sites for *Sium*, where care is required for machine operation. In the survey (excluding the Royal Military Canal which is the largest water-body and is weed-cut by boat and so an exception), the percentage of *Sium* plants in Environment Agency managed ditches was 3% of the total population and in the Romney Marsh Internal Drainage Board ditches it was 2.4%. This may be compared to 94.6% of plants in private ditches, highlighting vulnerability to annual ditch management. Known *Sium* populations in annually maintained ditches on the Romney Marsh which have had a de-silting operation did not respond well and most populations have not reappeared after 10 years from de-silting.

A study site was set up in collaboration with the Environment Agency to see how *Sium* reacted on a long standard stretch of the back ditch (Government Drain) of the Royal Military Canal which stretched for 1.3 km with different weed cutting regimes. This ditch is historically weed-cut every late summer and it was hoped to vary the intensity of the weed cutting and monitor the recruitment and plant numbers of *Sium* over time. The study showed a 66% increase in plants over three years (2008-2010 inclusive) along the 1.3km section of ditch with particular increases in a non-intervention control section and a medium weed-cut section. Decreases were seen in a heavy weed-cut section of the same ditch. The study did not lead to recommendations or actions, but it is possible to conclude from this and other evidence that the species does not thrive with intrusive annual ditch management regimes; its niche seems to require limited ditch maintenance to control reed domination, the avoidance of overgrazing and freshwater, rather than brackish, drainage and there is little evidence of its ability to spread.

Our Kent records for 2010 onwards are focused on recording location and its general character (e.g. ditches, marsh dikes, stream and the banks of the Royal Military Canal); also plant numbers, which range from single plants to 51, and records of patches without differentiation of plant numbers. We have not sought to record the character of adjoining land (arable or pasture) although records include parts of The Dowels which are pasture. Access was not achieved in relation to many areas where the 2000 survey reached, and land use has moved on considerably since then, with continued change (Owen Leyshon, personal communication) from grazing to arable. We have also not sought to record associated flora, although the 2000 survey provides data.

The 2000 survey showed that 53% of the recorded sites were found with adjoining arable land use, compared with 26% on grazing pasture. The arable land was more than twice as likely to support small populations of the plant, whilst large populations were twice as likely to be found on pasture. The survey assessed 55 *Sium* locations for habitat character, showing that it was found most frequently growing among emergent vegetation within ditches, associated with a range of emergent fen species. Out of the 55 locations the plant was found actually in the ditch in 50 locations and in only five locations was the plant found on the ditch banks. So far as concerns associated flora, the most frequent emergent companion species were *Sparganium erectum* (Branched Bur-reed, in 46% of quadrats), *Glyceria maxima* (Reed Sweet-grass, 36%) and *Alisma plantago-aquatica* (Water-plantain, 28%). The most frequently associated floating and aquatic plants were *Lemna minor* (Common Duckweed, 48% of samples) and *Lemna trisulca* (Ivy-leaved Duckweed, 22%). Numbers tended to be lowest amongst dense stands of *Phragmites australis* (Common Reed) and greatest in younger fen communities or successional communities with less shade.

Kenardington. Photo by Sue Buckingham, 25 July 2012

Sium latifolium is distinctive, being a tall (to 2 metres) umbellifer of wet habitat with large, coarse simply-pinnate leaves (other than the spring submerged leaves, which are more finely divided). *Berula erecta*, which grows in similar habitat, is no more than half the size, with smaller umbels (having 7-14 rays as compared with the other's 20-30 rays). The other principal tall umbellifer of ditches is the common *Oenanthe crocata* (Hemlock Water-dropwort), whose 3-4 pinnate leaves are more parsley-like.

This account has benefited greatly from the assistance of Owen Leyshon.

Solidago virgaurea L. (Goldenrod)

vc 15 and 16

Rarity / scarcity status

Solidago virgaurea is frequent across the British Isles in a wide range of habitats, open or shaded, basic or (more usually) acid. Its inclusion in this register is as a result of its designation in 2014 as **Near Threatened**, the extent of its occupancy in England having declined by 24% in comparing data from 1930-60 and 1987-99 respectively. There is evidence of decline in Kent, with a 28% drop in total tetrad records between 1971-80 and 1991-2005, and this appears to have continued. The species is still neither rare nor scarce in Kent, but the decline is concerning. It is a Kent axiophyte and so is indicative of good habitat.

Boughton under Blean. Photos by Lliam Rooney, 6 September 2010

Account

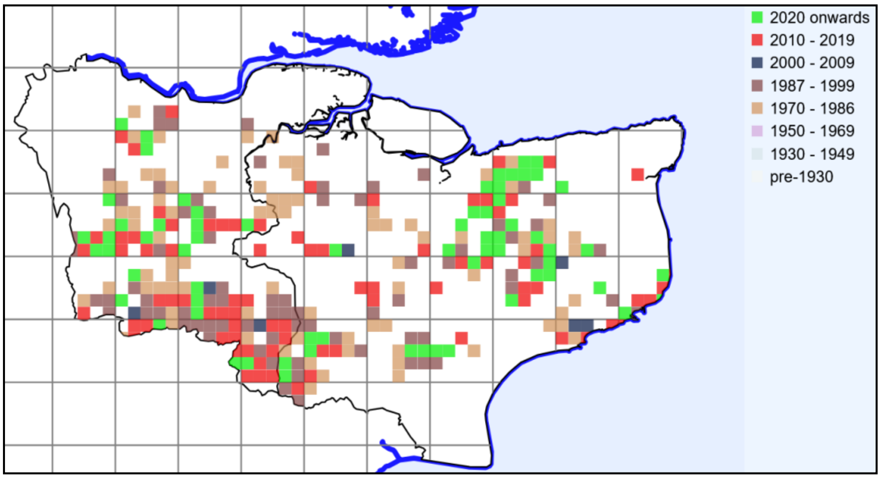
The first published Kent record is in John Gerard's Herball (1597), 'in Southfleete, and in Swanscombe wood also neere unto Gravesend'. Almost all of Swanscombe Wood was destroyed in the excavation of the Eastern Quarry (since being developed as Ebbsfleet Garden City), but *Solidago virgaurea* was recorded as still here in 1946 and again in 2011. The first East Kent record was by Thomas Johnson (*Descriptio Itineris*, 1632) in a wood near Faversham to which he was guided by a local apothecary. *Solidago virgaurea* is given by Hanbury & Marshall (1899) as common on woods and banks in every botanical district, so no specific records were given, other than Gerard's. That frequency and ubiquity is attested by local Floras: Edward Jacob gave it as '*In Woods and Hedges – Common*' (*Plantae Favershamienses*, 1777); Thomas Forster found it 'In woods and groves; on the commons, forests, and elsewhere, very common', noting also a small variety with flexuose stalks in dry places in forests (*Flora Tonbrigensis*, 1816); Daniel Cooper noted it on a range of substrates, generally acid but also basic - on the gravels of Blackheath, at Castle Wood atop Shooters Hill and in a gravel pit behind, at Charlton Wood, at Darenth Wood, and at Stone chalk pit (*Flora Metropolitana,* 1836).

Francis Rose regarded it as in Kent a plant of dry woods and hedgebanks on various non-calcareous soils, very common in most parts of Kent other than the marsh districts, but never found on calcareous soils inland, though on chalk sea-cliffs and adjacent downlands (e.g. St. Margaret's Bay, Abbot's Cliff, Lydden Spout and Langdon Bay) it could be found as a small form, perhaps, he surmised, as a result of exposure or being a different ecotype. It will be noted, however, from the distribution map below that there are many inland records in areas where the underlying geology is chalk, but it is possible that these are a result of an overlay of acid soils from Tertiary drift deposits; geology noted by Francis Rose in relation to records included drift at Newnham, as well as the more expected Folkestone Sand, Hythe Beds and Weald Clay elsewhere.

Roadside bank habitat, Underriver.
Photo by David Steere, 28 August 2016

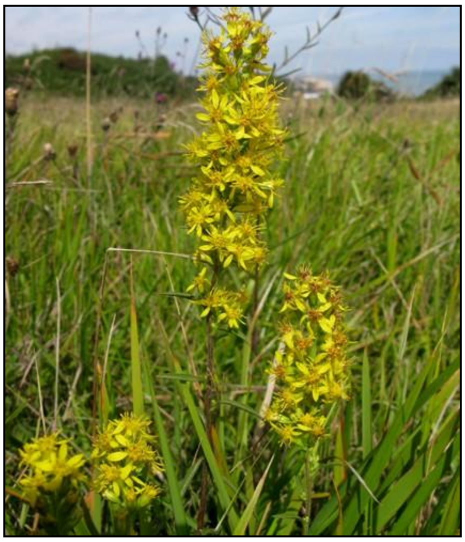
Philp (1982) recorded it for 1971-80 in 272 tetrads across the county, but with concentrations in the Weald, the west Kent Lower Greensand, the terrain on the Thanet and Lambeth Group Formations in the north west and the Blean (Thanet Group Formation). However, in the 1991-2005 survey of Philp (2010) presence in only 195 tetrads was noted, and in the period 2010-24 we have recorded it in just 150 tetrads (212 monads). This last figure represents a drop of about 45% in the last 45 years or so; this is to a degree understated, since five of those tetrads belong to metropolitan West Kent, which was excluded from Eric Philp's surveys. The reason for decline is not obvious, but the species is one of a number of fairly common species exhibiting a preference for infertile and moderately acidic soils which have shown recent decline sufficient to attract Near Threatened status.

The distribution map, given below, shows the apparently county-wide losses. Records from Philp (1982) fall within the 1970-1986 category and there are numerous ones which have not been overlain by more recent discovery; Philp (2010) records are split between the date classes of 1987-1999 and 2000-2009, although of the latter there are only four which went into that publication.



***Solidago virgaurea* Kent records to 2024 mapped at tetrad level, from BSBI database.**

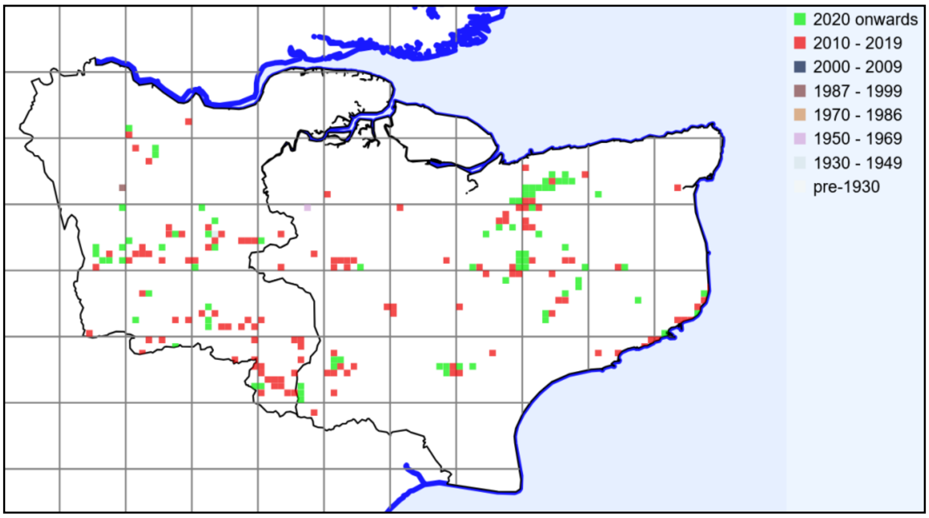
Our recent records, other than for the east coast chalk grassland, have (where noted) generally been in acid woodland or forest rides, glades or margins where there is partial shade; also on shaded roadside or pathside banks on sand or Weald Clay, sometimes with little other vegetation, depending on the amount of shading. In the very shaded laneside locations, it is sometimes accompanied by *Hieracium* spp. (Hawkweeds). Most of our records, however, have no indication of habitat, and we have no material data on associated species. The accompanying habitat photo from Underriver shows a Weald Clay roadside location which is wetter and more open than is often the case; this may be why only a single plant is present, because of the competition from *Brachypodium sylvaticum* (False-brome) and *Carex pendula* (Pendulous Sedge). The coastal form (see habitat photo from Kingsdown cliff-tops) is, however, capable of withstanding competition from *Brachypodium rupestre* (Tor-grass).



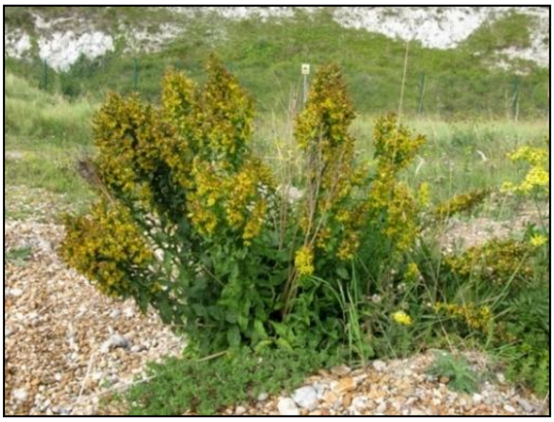
Habitat, Kingsdown coastal cliff grassland.
Photo by Sue Buckingham, 4 September 2010

Additional mapping is given here at monad level to show finer resolution; historic records largely do not appear, as monad recording only became the norm in Kent from 2010.

Solidago virgaurea **Kent records to 2024**
mapped at monad level, from BSBI database.



Solidago virgaurea is not readily mistaken for any other species, and the panicles with the remains of the white pappus from previous flowering/seeding are very visible for winter recording. It is, however, a very variable species. Most variation has been observed in relation to differences in altitude, but a very untypical appearance can be seen from the clump illustrated here from an anomalous beach habitat



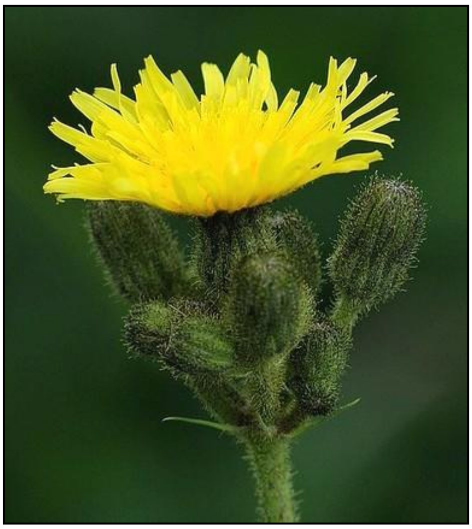
Kingsdown beach. Photo by Sue Buckingham, 31 August 2011

Sonchus palustris L. (Marsh Sowthistle)

vc 15 and 16

Rarity / scarcity status

Sonchus palustris is a tall perennial of marshes and riversides in south east England, especially East Anglia, the Thames valley and Kent, with only a scatter elsewhere. It is **nationally scarce**, but its threat status is one of 'Least Concern'. In Kent, it is **scarce**.



Stodmarsh. Photo by Lliam Rooney, 11 August 2010

Account

The first published record for Marsh Sowthistle in Kent – and, indeed, in the British Isles – is by Christopher Merrett in his *Pinax Rerum Naturalium Britannicarum* (1666): 'In the Meadows betwixt *Woolwich* and *Greenwich* by the banks of the Thames'. Knowledge of it by the Medway (where it still grows) came much later: Alexander Irvine's *The Illustrated Handbook of the British Plants* (1858) states: 'In the river Medway, between Aylesford station and the village – W.P. [William Pamplin] and A.I., Sept. 5, 1857. As this is the first time this plant has been observed during the last twenty-five years, the time of its discovery is precisely entered. It was observed in the Medway, opposite Halling, in 1831, when the observer did not know that it was one of the very rarest of British plants.' That observer may well have been Irvine himself, who included the record in his *The London Flora* (1838).[801]

Hanbury & Marshall (1899) referred to it as being a rare and local plant of river-sides and thickets. Both co-authors went to see it: Marshall saw it on the right bank of the Medway, about a mile above Aylesford; Hanbury recorded it on the edge of copses by the large wet meadow south of Snodland, and at what appears to have been a different Snodland location further north in reeds by the river, also in the reed-beds of the river near Burham. By then Marsh Sow-thistle was extinct at Merrett's original site and they were sceptical about claims for Woolwich, Keston, Minster, Monkton, St. Nicholas and near Stourmouth (this last perhaps should not, it transpires, have been discredited).

Stodmarsh. Photo by Sue Buckingham, 30 July 2014

Francis Rose noted *Sonchus palustris* as a plant of tidal reed swamps along the upper part of the tidal Medway, rare and extremely local, but locally abundant. He made counts of 200 spikes on the left bank below New Hythe towards Snodland (1945), and over 500 on the right bank (1945-53); west of Eccles were 20 spikes

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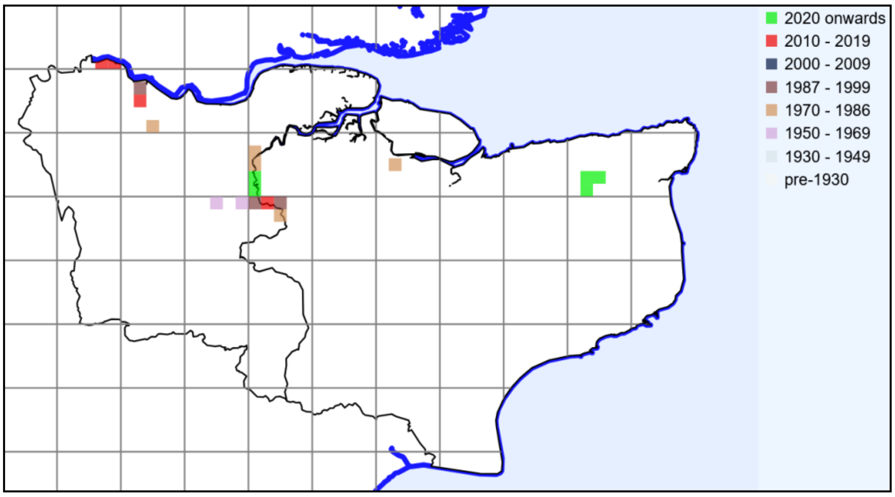
[801] There is, however, a specimen at the Perth Museum and Art Gallery which is attributed to this species, from the herbarium of Professor J.H. Balfour, collected at Wouldham on 5 September 1825. Balfour was a Scottish botanist and would have been 17 at the time, but was already collecting specimens. Herbaria United data show his numerous Scottish specimens .around that date, but only two Kent plants – the *Sonchus* from Wouldham and *Artemisia maritima* later in September from Northfleet, so they can scarcely have been collected by Balfour..The (East Kent) Wouldham location is apparently the same as Irvine's, Wouldham being 'opposite Halling', and Irvine's *The London Flora* was misleading in this respect as just referring to Halling (West Kent). There is also a specimen at **CGE** from Wouldham dated 16 July 1827.

(1945) and in an island site west of Burham cement works there were 200-300 spikes (1945). Records extended from ¼ mile below Allington Lock to Burham Marshes. There were anomalous outliers at Leybourne Castle lakes (1958) and Wouldham (one roadside plant, 1946).

Philp (1982) shows thorough surveying of the Medway banks and associated marshes (eight tetrads); and there were two further records. One was near Sittingbourne (TQ96H, no details but probably associated with Milton Creek or Murston Lakes) and the other was planted (but considered naturalised) in an arm of the River Darent at St John's Jerusalem TQ57K). Philp (2010) gave six tetrads, of which four related to the Medway (a drop from the eight tetrads given in the earlier survey, which may or may not represent actual losses) and two from a new location at Stodmarsh. The environs of the tidal Great Stour do not seem unlikely for the species, although Hanbury & Marshall (1899) dismissed George Dowker's record from near Stourmouth as probably luxuriant *Sonchus arvensis* (Field Sow-thistle). However, Eric Philp's Stodmarsh records identify a presence which Alex Lockton has noted[802] as having spread considerably in more recent years in fields which have been flooded and ungrazed following coal mining subsidence and which have developed a species-poor community almost entirely dominated by *Phragmites australis* (Common Reed). This includes vegetation communities S4 (*Phragmites australis* swamp and reed-beds) and S26 (*Phragmites australis* – *Urtica dioica* Tall-herb fen). Within this habitat, *Sonchus palustris* has developed as occasional clumps, most abundantly towards the Grove Ferry End, but scattered through most areas of reed-bed.

***Sonchus palustris* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Our 2010-24 records (totalling nine tetrads, 15 monads, see distribution map) recognise the continuation of the Stodmarsh colony, but give only three tetrads (equivalent to six monads) for the Medway populations. The drop from eight tetrads (1971-80) to four (1991-2005) and then to three appears concerning, but it is not obvious what may have prompted a decline. It is clear that there have been substantial changes in habitat at the Medway upper reaches since Francis Rose's searches in the 1940s; it is not so clear how far habitat there may have been compromised since the 1971-80 survey. However, the river banks in TQ76C and TQ76D, i.e. north of Halling and Wouldham, which were not in Francis Rose's list, but which did appear in Philp (1982), should be comparatively less affected. If the decline is an artefact of recording, this would not be surprising given the difficulty of accessing some parts of the reed-beds and riverbanks.

The distribution map also requires interpretation as regards recent north-west Kent records. In 1963, J.F. and P.C. Hall found a large clump in a reed-bed by the River Cray before it joins the River Darent (TQ 533 758; noted as TQ 532 756 in 1980) which was thought might have arrived with barge traffic between the Medway and Cray. It continued to be seen at least until 2002, although reduced in quantity to five flowering stems; it was not reflected in Philp (1982) and Philp (2010) because it was located outside the administrative county boundary, although within vc16. It had gone by 2005, swamped by reeds and/or burnt. Seed was saved, thanks to Mark Spencer, and resultant cultivated seedlings were introduced by Chris Rose into various metropolitan north west Kent locations, suitably distant from the original site. The main location is 630m away, at the Thames Road Wetland, Bexley, where plants were introduced in 2011 and by 2020 had produced self-sown seedlings which reached flowering size, with many small seedlings present. Other Kent introduction sites have been at Crossness (TQ 49168 80330 and another planting nearby), Erith Marshes (TQ 4799 8044) and (within reach of the tidal waters) Deptford Creek (TQ 37630 77307). Plantings at Erith Marshes south of Eastern Way / A2016 have been unsuccessful; one set of plants was destroyed by horses.

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[802] Lockton, A. (2023). *The Flora of Stodmarsh National Nature Reserve*.

Mountford (1994a)[803] describes *Sonchus palustris* as in England generally a plant of tall vegetation by major lowland rivers, by the Thames (and this could have been applied to the Medway as well) amongst *Phragmites australis* in strips of marshy land fringing the river's lower reaches, growing in wet peat or alluvial soils which range from neutral to alkaline and rich in nitrogen, and being moderately tolerant of salinity. Along the Medway it may typically be found in the riverine strips separated from adjoining land by flood embankments, where little else grows in the muddy, tidally affected margins other than *Phragmites australis.* Flowering stems of *Sonchus palustris*, however, reach the same height as, or overtop, the reeds so that wind dispersal of the seeds is facilitated.

Stodmarsh. Photo by Sue Buckingham, 30 July 2014

Sonchus palustris is capable of being confused with tall *Sonchus arvensis* growing in similar habitat. It may be distinguished by the pointed (not rounded) auricles of its stem-leaves and by its straw-coloured (not bright brown) achenes. It can reach taller than the tallest *Sonchus arvensis* and exceed the 2.5m height which normal Flora descriptions give.

[Note: in this table the tetrad records from Philp (1982) are assigned a vice county in the BSBI database (or both vice counties) where the tetrad straddles the Medway (which here divides vc15 and vc16). However, this does not seem reliable, and so is not given in this table, otherwise misleading assumptions might be made as regards which riverbank is indicated.]

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
[Erith Marshes] (metropolitan vc16)]	[TQ4780]		[4 July 2015]	[RMB]	[TQ 4799 8044, planted by CR.]
[Crossness Nature Reserve (metropolitan vc16)]]	[TQ4980]	[Nature Reserve]	[30/10/2012]	[CR]	[TQ49168 80330, planted by CR in 'ridge and furrow' area within fenced part of nature reserve, grown from seed from plants introduced to Thames Road Wetland in 2011.]
[Barnes Cray (metropolitan vc16)]	[TQ5275]	[Bexley Council owned wetland]	[(1) 7 June 2018] [(2) 25 October 2012] [(3) 27 May 2011]	[(1), (2) & (3) CR]	[(1) Self-sown seedlings now present from planted specimens.] [(2) TQ 52788 75264, Thames Road Wetland, additional 15 small plants (cultivated from seed derived from plants introduced here in May 2011) planted out by CR on west end of northernmost ditch bund.] [(3) Seven plants cultivated from seed from defunct TQ5275 wild colony planted out by CR on

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[803] Mountford, J.O. (1994a). *Sonchus palustris* L. Marsh sow-thistle. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. , *Scarce plants in Britain*, JNCC, Peterborough.

					Thames Road Wetland.]
Barnes Cray (metropolitan vc16)	TQ5375		(1) 2002 (2) 2000 (3) 5 September 1992 (4) 1 September 1991 (5) 1985 (6) 5 July 1980	(1) MAS (2), (3) & (4) JRP (5) BP (6) LNHS	(1) TQ5375, Crayford Creek (tidal), only five flowering stems. {Gone by August 2005.] (2) TQ5375, still there. (3) TQ5375, seems reduced in quantity. (4) Bank of R. Cray. (5) Still going strong. (6) Increasing. [See main text for earlier records.]
Sutton-at-Hone	TQ57K		27 August 1975	JRP	Arm of R. Darent at St John's Jersusalem, where naturalised from planting.
West of Aylesford	TQ75E		Before 1981, after 1970	Philp (1982)	Vc16.
Aylesford	TQ75J, includes TQ7358		(1) 18 July 2018 (2) 19 August 2016 (3) Before 1981, after 1970	(1) DM (2) BW (3)Philp (1982)	(1) TQ 7310 5877 to TQ 7312 5874, quite a lot of plants, vc15. (2) TQ7358. (3) TQ75J.
Allington	TQ75N		Before 1981, after 1970	Philp (1982)	TQ75N.
Allington Lock	TQ75P		Before 1981, after 1970	Philp (1982)	TQ75P.
Snodland / Burham	TQ76A, includes TQ7061, TQ7161, TQ7160	SSSI	(1) 17 Octlober 2024 (2) 9 August 2024 (3) 16 October 2023 (4) 10 September 2022 (5) 21 July 2021 (6) 30 September 2016 (7) 2 October 2015 (8) 14 November 2011 (9) 15 August 2011 (10) 2004 (11) 7 July 2001 (12) 1991-99 (13) 1993-94 (14)1 July 1987 (15) 3 June 1980 (16) Before 1981, after 1970	(1), (2) & (3) ME & DCh (4) DM (5) GK (6) SP & DG (7) SP & DG (8) SB (9) RR (10) DG (11) EGP (12) JP (13) FB (14) EGP & JB (15) FR (16) Philp (1982)	(1) TQ 714 612, three plants in seed by river path before it becomes impassable, vc16. (2) 177 flowering stems between TQ 715618 and the memorial stone at TQ 70894 61862, with plants present in TQ7061, TQ7162 [i.e. in TQ76B] and mostly TQ7161, all except for 9 being on the river side of the embankment path, vc15. (3) TQ 714 612 to TQ 715 613, west bank, 12 plants/clumps in seed, vc16. (4) Burham Marshes (vc15), TQ7161 (5) Scattered plants in *Phragmites* marsh under tidal influence, e.g. on river side of embankment path at TQ 71398 61306, TQ 71459 61276, TQ 71359 61300, as well as on the inward (inned) side nearby, vc16. (6) TQ 714 611, thinly scattered, vc16. (7) TQ7161, thought to be spreading over the years, vc15. (8) Estimated 50 plants west of sea wall at margin of reed bed, spread over 200 metres between TQ 71493 61713 to TQ71540 61507 on KWT reserve, vc15. (9) Between TQ 715 619 and TQ 715 6015, Burham Marshes KWT reserve, on west side of sea wall for a depth of 1 to 2 metres, many plants flowering, vc15.. (10) TQ76A, vc not specified. (11) TQ76A, vc15. (12) TQ 709 605, Local Wildlife Site TM30. (13) TQ 716 612, Burham Supply Site (Southern Water Services), vc15. (14) TQ 716 602, Eccles, vc15. (15) TQ76A [tetrad assumed], tidal reed bed – upper edge, Snodland, vc16.

					(16) TQ76A.
Holborough / Wouldham	TQ76B, includes TQ7062, TQ7063	SSSI	(1) 19 August 2024 (2) 22 August 2021 (3) 4 August 2013 (4) 15 August 2011 (5) 26 July 1988 (6) 25 August 1985 (7) Before 1981, after 1970	(1)ME & DCh (2) GK (3) SP & DG (4) SP & DG (5) GK (6) GK (7) Philp (1982)	(1) Part of TQ76A record of 177 flowering stems between TQ 715618 and the memorial stone at TQ 70894 61862, with plants present in TQ7061, TQ7162 [i.e. in TQ76B] and mostly TQ7161, all except for 9 being on the river side of the embankment path, vc15. (2) Frequent, scattered discontinuously along edge of tidal reed-beds below embanked path from TQ 7086 6228 northwards to monad boundary c. TQ 709625, frequently with *Althaea officinalis,* vc16. (3) TQ 7086 6239 to TQ 7098 6254, scattered all along riverbank, Holborough vc16. (4) TQ 708 639 to TQ 706 638, frequent along riverbank, Wouldham Marshes, vc15. (5) TQ76B, reed-beds by river near Snodland, vc16. (6) TQ76B, Holborough Marshes, reed-beds by river, vc16. (7) TQ76B.
Halling / Starkeys	TQ76C		Before 1981, after 1970	Philp (1982)	TQ75C.
Cuxton / Wouldham Marshes	TR76D		Before 1981, after 1970	Philp (1982)	TQ75D.
Eccles	TQ7261		1993-94	FB	TQ 723 611, Eccles Lake.
Murston	TQ96H		Before 1981, after 1970	Philp (1982)	TQ96H
Stodmarsh	TR26F, includes TR2261	SSSI, national nature reserve	(1) 10 September 2022 (2) 2 September 2022 (3) 4 July 2022 (4) 8 September 2015 (5) 30 July 2014 (6) 7 August 2013 (7) 25 July 2013 (8) 1991-99 (9) 1996	(1 AL (2) AL & BH (3) AL & KC (4) AL & JM (5) SB & LR (6) CO (7) AL & JM (8) EGP (9) un-attributed EN record	(1) TR 2293 6189. Ditch survey, ditch choked with *Phragmites* and *Hydrocharis*. (2) TR 2262 6167, TR 2244 6138, TR 2260 6174. a reedbed ditch, ditch survey. (3) TR 2264 6207, ditch survey. (4) TR 2246 6199, several plants. (5) TR 22562 61312, a single plant along footpath, in reeds. (6) TR2261, common along track near Marsh Hide and adjacent reed beds. (7) TR 2263 6178, in S26, *Phragmites australis – Urtica dioica* tall-herb fen. (8) TQ26F (9) TR 222 168.
Upstreet	TR26G, includes TR2262, TR2263, TR2362, TR2363	SSSI, national nature reserve	(1) 4 July 2022 (2) 4 July 2022 (3) 17 August 2021 (4) 06 August 2021 (5) 29 June 2017 (6) 21 April 2017 (7) 4 August 2016 (8) 28 July 2016 (9) 7 July 2016 (10) 20 January 2015 (11) 7 August 2013 (12) 7 August 2011 (13) 27 March 2011 (14) 3 August 2010 (15) 1991-99 (16) 1996	(1)) AL, PW & KC (2) AL & PW (3) AL (4) CO (5)DC (6) AL & JM (7) AL (8) AL & JM (9) AL & JM (10) AL & JM (11) CO (12) DM (13) SB (14) JA (15) EGP (16) un-attributed EN	(1) TR 2245 6216, ditch survey. (2) TR 2273 6010, ditch survey, Meadow ditch. (3) TR 2325 6246, pool at the end of the ditch. (4) TR2363. (5) TR 23125 62510. (6) TR 2304 6282, one seedling by the river; not seen in this area by recorders before. (7) TR 2243 6217, a few plants. (8) TR 2323 6241. (9) TR 232 625, by the lake in front of the Feast Hide. (10) TR 2346 6271, dozens of plants in *Phragmites* fen, the largest patch seen.

				record	(11) TR2362, reed-beds adjacent to river, abundant. (12) TR 23076 62524, two of last year's dead stems standing above reeds. (13) TR 23031 62835, twenty plants by R. Stour. (12) TR26G.] (14) TR 231 628.
West Stourmouth	TR2462		22 August 2021	AL	TR 2400 6263.

Sparganium natans L. (Least Bur-reed)

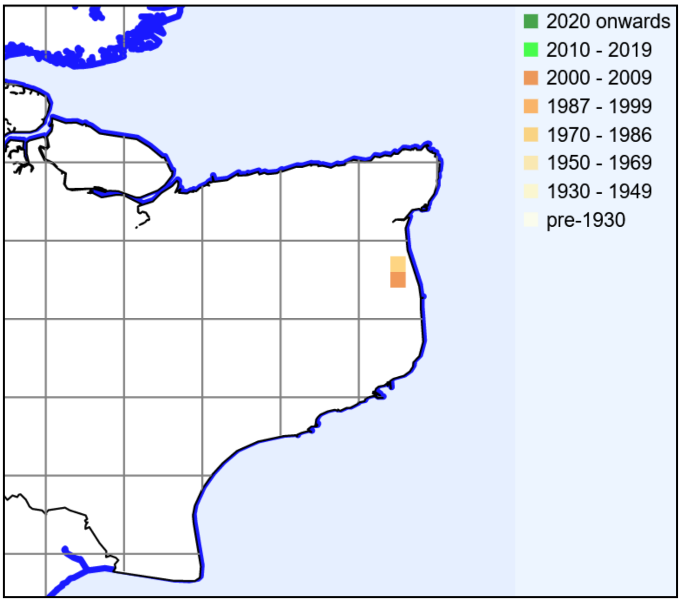
vc 15, long gone from vc16

Rarity / scarcity status

Sparganium natans grows in lakes, pools and ditches scattered across most of the British Isles, but is largely absent from southern and central England. It is regarded as **Vulnerable** to the risk of extinction in England. This risk assessment is based on a reduction both in the overall geographical extent of its occurrence and in the area of occupancy within that range. A comparison for England over the periods 1930-1969 and 1987-1999 showed that its overall range had reduced by 35% and its area of occupancy had declined so that there was a calculated 38% reduction in the likelihood of recording the species. In Kent, it has always been, and remains, **rare**; it has not been recorded recently**.**

Account

The first Kent record for *Sparganium natans* is a specimen in the herbarium of Dillenius (1684-1747)[804], noted as '*Near Tunbridge Wells'*; it is always possible that this could have been Sussex, but no later records for this area have been noted in either county. Otherwise, Kent records are restricted to the north-east of the county. It was given for ditches at the Brooks, Margate by Dr. R.E. Hunter (d.1824), apparently an interesting habitat, although Hunter's records are not always to be trusted. The classic area, however, is around Ham and Worth Minnis. G.E. Smith noted it in dykes at Ham Ponds, also with *Nymphaea alba* (White Water-lily), in his *A Catalogue of rare or remarkable phaenogamous plants, collected in South Kent* (1829), where later it was still seen by one of the authors of Hanbury & Marshall (1899). They regarded it as a rare plant of ditches and pools and also cited records from the marshes at Sholden and near Deal (these could be the same area).



***Sparganium natans* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Francis Rose described it in his manuscript *Flora of Kent* as a native of dikes in calcareous fens, very rare, but still locally abundant between Worth and Hacklinge, a relic of the flora of the primaeval fens of this area. In his paper *The East Kent Fens*[805], he does not mention the species in the ditch flora lists, and it looks as though he became aware of it after then, and continued to see it in a fen dike at least up to 1960, when he also recorded it in a dike, ½ mile east of Hacklinge. Philp (1982) gave it as very rare, then only known in a few marsh dykes at a tetrad near Worth Minnis; the position was unchanged in Philp (2010). Between them, the two Philp surveys understate the position, as *Sparganium natans* was found in two neighbouring tetrads in the 1980s. However, the last Kent record was in 2003, so current status in the county is not known. This may be a consequence of a lack of targeted recording, since some earlier sites are known to the level of 10-figure grid references and so could be targeted.

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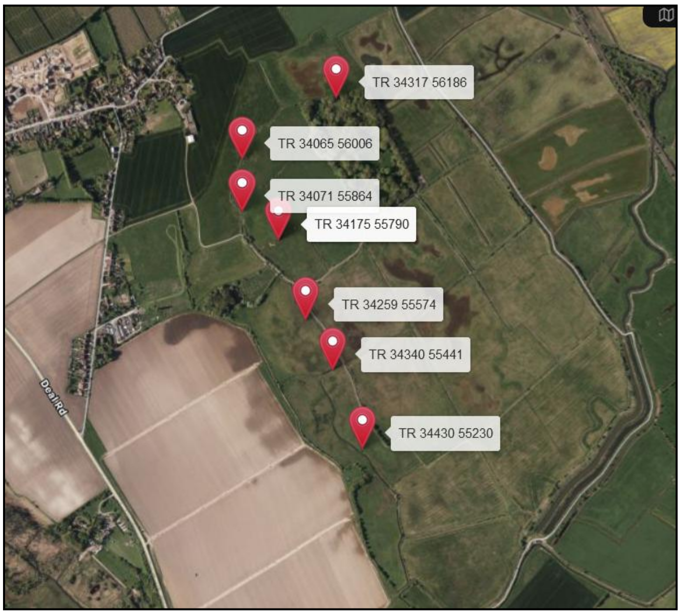
[804] G.C. Druce, ed. S.H. Vines (1907). *The Dillenian Herbaria. An account of the Dillenian collections in the Herbarium of the University of Oxford*. It is given here as growing '*loco udo rivuloso (in a boggy place betwixt Hills)*', but 'Hills' would much better read 'rills', as Hanbury & Marshall (1899) indicate. Dillenius remarks that the plants were small; he had seen much larger ones in ditches.

[805] Rose, F. (1950). The East Kent Fens, *Journal of Ecology* 38: 292-302. Rose's copy of Hanbury & Marshall (1899) has a note 'Worth Minnis, Wilson, [19]50 ([19]50!) l[ocally] abund[ant]. The original finder could have been L.W. Wilson, who contributed many north-east Kent records to Francis Rose.

Sites with 10-figure grid references near Worth Minnis, 1982-83



Sparganium natans grows in acid or alkaline lakes, pools or ditches with high organic content, but currently in Kent is limited to ditches over peat, with calcareous drainage, providing fen conditions with possibly some former brackish influence. It normally grows in 10-50cm of water, producing flat leaves floating on the surface, very rarely erect.

The principal identification issue in Kent is separating it from *Sparganium emersum* (Unbranched Bur-reed) which also usually has floating leaves (*Sparganium erectum* (Branched Bur-reed) seldom does). The leaves of *S. natans* have a flat (not triangular) cross-section and are relatively short at 30 (-50) cm long, and narrow – only 2-6(7)mm wide, whereas those of *S. emersum* are 4-5(10) mm wide and those of *S. erectum* 7-10(18)mm. *S. natans* and *S. emersum* both have unbranched inflorescences, but the latter has 3-10 male heads well separated and *S. natans* has 1-3(4) male heads clustered close together.

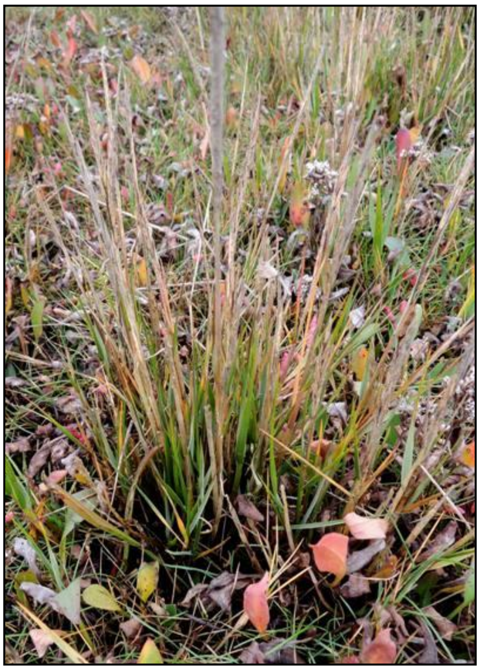
Site	Grid reference	Site status	Last record date	Recorder	Comments
Worth, north east	TR3456	SSSI	(1) 2 March 1983 (2) 1982	(1) ACH (2) ACH	(1) TR 343 560, Sandwich & Pegwell Bay survey. 2) (a) TR 34065 56006, Hacklinge ditch survey, ditch 366. (b) TR 34317 56186, Hacklinge ditch survey, ditch 392.
Hacklinge	TR35M, includes TR3454, TR3455	SSSI	(1) 2003 (2) 23 June 2002 (3) unknown (late 1990s / early 2000s) (4) 24 July 1991 (5) 2 March 1983 (6) 1982 (7) Before 1981, after 1970	(1) CEC (2) EGP (3) BBa (4) FR (5) ACH (6) ACH (7) Philp (1982)	(1) TR 34071 55864, Hacklinge ditch survey, ditch 121. (2) TR35M. (3) TR 34301 55534, Minnis Sewer, with *Potamogeton acutifolius*. (4) Ham Fen, TR3454. (5) (a) TR3455, Sandwich & Pegwell Bay survey. (b) TR 347 546, Sandwich & Pegwell Bay survey. (6) (a) TR 34259 55574, Hacklinge ditch survey, ditch 369. (b) TR 34175 55790, Hacklinge ditch survey, ditch 329. (c) TR 34430 55230, Hacklinge ditch survey, ditch 336. (d) TR 34340 55441, Hacklinge ditch survey, ditch 338. (7) TR35M.

Spartina maritima (Curtis) Fernald (Small Cord-grass)

vc 15, gone from vc16

Rarity / scarcity status

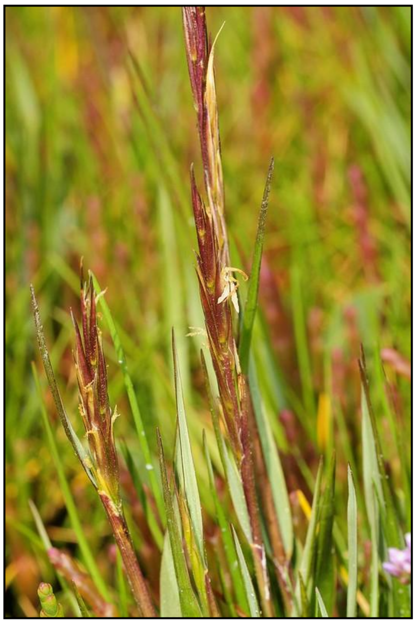
Spartina maritima is a coastal or estuarial plant, whose main current distribution is in Hampshire, including the Isle of Wight; Essex; Suffolk and the Wash. It was formerly much more widespread, but its range has contracted such that its status is now **nationally scarce** and **Endangered**, the extent of its occupancy in England having declined by 57% in comparing data from 1930-60 and 1987-99 respectively. It is a species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006. In Kent, there was an absence of sightings after 1990 which led to it being placed on the 'probably extinct' list; but it was re-found in 2020 and is to be regarded as very **rare**.



Castle Coote. Photo by Lliam Rooney, 26 October 2020

Account

The first Kent record of this species is probably by Thomas Johnson in his *Iter Plantarum* (1629), where he mentions *Spartum nostras parvum* along the seashore.[806] Otherwise, it is not noted until the early nineteenth century. Samuel Goodenough, Bishop of Carlisle, noted it as plentiful on Sheppey Isle (given in Sir James Smith's *English Flora*, vol. 1, 1824). Matthew Cowell's *A Floral Guide for East Kent, etc*. (1839) attributed to the Rev. W. Wood a record of the Cord-grass between Whitstable and Seasalter; and referred to it also being alongside Oare Creek and at Harty Ferry. Hanbury & Marshall (1899) gave only these records, and described it as rare and very local on muddy sea-shores.



Castle Coote. Photo by Lliam Rooney, 19 July 2021

Francis Rose in his manuscript *Flora of Kent* mentioned it as rare in St Mary's Bay, St Mary Hoo in 1958; this appears to be the last vc16 record. He also noted it as still present in some of the historic sites: it was still present at Sheppey (Shellness, 1946-60; East Harty Marshes, 1946; West Harty Marshes, 1947; and Windmill Creek at the east end of Elmley, 1949) and also on the mainland across the Swale, viz. at Nagden Marshes (1924 and 1945-60) as well as the west side of Oare Creek.

Philp (1982) described it as a very rare plant of mudflats, then only known from one locality along the Swale off Nagden Marshes (TR06H). The reference to "off" Nagden Marshes suggests that this was Castle Coote (South Bank of Swale Nature Reserve) because this low-lying area projects into the Swale north of the marshes. At this location it was sighted by a WFS meeting on 12 August 1990[807] (subsequently confirmed by Eric Philp from material collected then). Whilst it was apparently also seen by Eric Philp at Harty Ferry in 1988, in Philp (2010) he declared that, although specifically searched for, it could not be found in any of its previous known localities during his 1991-2005 survey and might be extinct.

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[806] The identity is not beyond doubt. This Latin name has elsewhere been applied to *Nardus stricta* (Mat-grass), which can scarcely have been present here. Francis Rose considered that there was a possibility *that Elymus athericus* was intended, although *Spartina maritima* was more likely.

[807] Local meetings, 1990, in *Wild Flower Magazine* (1991) **420**: 12.

The species was subsequently placed on the county 'probably extinct' list and it was not until 2020 that it was seen again, in one of the traditional localities, at Castle Coote. This sighting was made on 23 October by Fred Rumsey, Lliam Rooney and Caroline Ware, and the latter two revisited the next day to gather further data. Plants were seen at TR 03447 64736, which is a relatively high, dry and flat area of saltmarsh in the *Puccinellia maritima* (Common Saltmarsh-grass) zone, containing a few shallow pools. *Spartina anglica* (Common Cord-grass) was also present, mostly around the pool margins. Other associated species were those to be expected in such a saltmarsh habitat, including *Salicornia ramosissima* (Purple Glasswort) and *Salicornia disarticulata* (One-flowered Glasswort). The *S. maritima* plants were noticeable as being in tightly clustered spiky tufts with upright leaves, narrower than those of *S. anglica* in not exceeding 6mm across (those of *S. anglica* are 6-11mm across when flat).

S. anglica should be capable of being differentiated by the long terminal bristle extending the rachis of the inflorescence (1.8-5(5.5)cm, compared with 0.8-1.8(2.1) cm for *S. maritima*), but this could not observed consistently because of the loss of *S. anglica* bristles. Ligules also differ between the species, with that of *S. anglica* being (1)1.4-3.2mm long and *S.maritima* 0.3-0.8mm; in this case, the ligules were so small as to be scarcely observable. The site was also visited by a KBRG meeting on 15 September 2021, when the grass was noted as scattered in an area of saltmarsh c.25m x 10m.

Habitat, Castle Coote (note the presence of *Limonium vulgare* as well). Photo by Lliam Rooney, 19 July 2021

As well as being the smallest European *Spartina* species, *S. maritima* has an appearance of weak growth amongst other saltmarsh vegetation, contrasting with the larger and more vigorous *S. anglica*, which often forms large colonies on otherwise bare coastal or estuarial mud. Marchant & Goodman (1969)[808], however, refer to a wider amplitude of habitat for *S. maritima* elsewhere, including soft mud within gullies or alone in saltmarsh pans flooded at each high tide, as well as long-established turf of the upper saltmarsh. Gray (1994)[809] describes its upper saltmarsh habitat as one where the lower turf, with its wetter, possibly more saline depressions is preferred: *Limonium vulgare* (Common Sea-lavender) is a constant companion, and the presence of *Tripolium pannonicum* (Sea Aster) and *Atriplex portulacoides* (Sea-purslane) at more than a low density may show that it is too wet for *S. maritima*.

Small Cord-grass may spread by its relatively short rhizomes, or from vegetative fragments. Seed is probably very rare in Britain and this, coupled with its lack of vigour, may be a consequence of its being at the northern edge of its range. Gray (1994) refers to it being a tall, sward-forming plant in Spain and the southern part of its range, and possessing a method of photosynthesis more typical of tropical species. Always rare in Kent, it is unlikely that it has been ousted by *S. anglica*; Raybould et al. (1991)[810] attribute much of its British decline to physical erosion of its habitats, which may produce bare mud suitable for colonisation by *S. anglica*. It is possible that other successional changes could occur affecting growth conditions, such as the invasion of tall *Atriplex portulacoides* (Sea-purslane).

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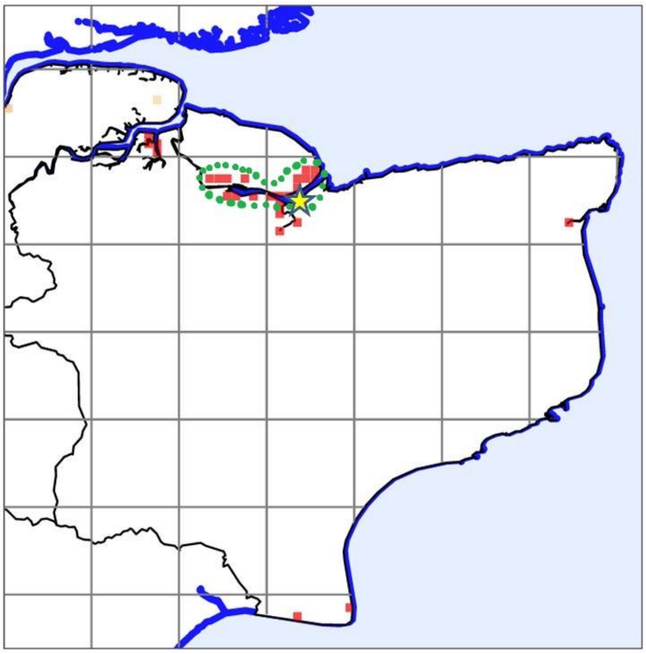
[808] Marchant, C.J. & Goodman, P.J. (1969). *Spartina maritima* (Curtis) Fernald. Biological Flora of the British Isles. Journal of Ecology **57**: 287-291.

[809] Gray, A.J. (1994). *Spartina maritima* (Curtis) Fern. Small cord-grass. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. (1994) *Scarce Plants in Britain*, JNCC, Peterborough.

S. maritima and *S. anglica* are both related. *S. maritima* was originally the only British Cord-grass, but it encountered introduced *Spartina alterniflora* (Smooth Cord-grass) in Southampton Water before 1870, and the two species hybridised. By 1892 a new fertile form had arisen there of allopolyploid origin, although not named as a species (*S. anglica*) until 1978. All Kent records of *S. maritima* x *alterniflora* (*S*. x *townsendii*) are likely to be of *S. anglica*, which has been planted to consolidate mud-flats as well as having spread on its own account.

It will be worthwhile searching the other historic sites mentioned above in order to see if *S. maritima* has been overlooked elsewhere. In order to focus on appropriate habitat, it is suggested that attention is directed to where *Salicornia disarticulata* may be found. The accompanying map shows East Kent monads where the *Salicornia* has been found 2010-24; a yellow star marks the *Spartina maritima* site; and green dots encircle the historic sites for that species, where search may be concentrated.



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[810] Raybould, A.F., Gray, A.J., Lawrence, M.J. & Marshall, D.F. (1991). The evolution of *Spartina anglica* C.E. Hubbard (Gramineae): genetic variation and status of parental species in Britain. *Biological Journal of the Linnean Society* **44**: 369-380.

Spergula arvensis L. (Corn Spurry)

vc 15 and 16

Rarity / scarcity status

Spergula arvensis is widely distributed in the British Isles, especially on cultivated ground but has been designated as **Vulnerable** to the risk of extinction in both England and Great Britain as a whole. In comparing data from 1930-60 and 1987-99 respectively its area of occupancy within its range in England has been found to have declined such there was a calculated 46% reduction in the likelihood of recording the species. The decline is particularly marked in Kent where there is a 72 % drop in records between surveys of 1971-80 and 1991-2005. It is neither rare nor scarce in Kent, but is fairly uncommon and its decline is concerning. The species is still neither rare nor scarce in Kent, but the decline is concerning. It is a Kent axiophyte and so is indicative of good habitat.

Hernhill. Photo by Lliam Rooney, 14 April 2012

Account

Because of its association with light cultivated soils, *Spergula arvensis* seed has been found in a range of archaeological contexts. A Mesolithic pit at Lenham yielded seed amongst charred plant remains, as also possible *Buglossoides arvensis* (Field Gromwell), although contamination of the feature was possible[811]. It was present in a cremation cemetery at Manston in a late Iron Age to early Romano-British context.[812] At Northfleet it was found associated with a late Iron Age hearth or oven [813] and at Cuxton, together with *Buglossoides arvensis* in early Iron Age pitfill.[814] Late Bronze Age material yielded seeds from investigations relating to the CTRL construction of Saltwood tunnel, together in a pit with the remains of a broad bean crop.[815] It has also been found at a late Bronze Age hut site at Minnis Bay, where it may have represented weed residue from threshing crops, although the species has been noted as a possible food plant (the same site also yielded a seed of *Coriandrum sativum* (Coriander), which is a surprisingly early record) .[816]

Hernhill. Photo by Lliam Rooney, 6 June 2012

The first Kent botanical record for the species is by Thomas Johnson on 13 July 1629 (*Iter Plantarum*) as part of a list made between Gravesend and Rochester. Amongst other early records Edward Jacob (*Plantae Favershamienses*, 1777) found it '*On sandy Grounds in* Hern-Hill [Faversham] – *common*; and Thomas Forster (*Flora Tonbrigensis*, 1816) described it as 'In cornfields and on heaths, not uncommon'. Hanbury & Marshall (1899) treated it as a native of fields and waste ground, chiefly on a sandy soil, rather common and found in all the botanical districts, so they did not give records other than where varieties could be distinguished. Francis Rose found it locally frequent on arable and waste ground, mostly on sandy soils and not (1950s/1960s) recently recorded for Thanet, Grain or Sheppey. Those areas have since remained nearly devoid of records.

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[811] Giorgi, J. (2006). The charred plant remains from Sandway Road, Lenham, Kent. CTRL Specialist Report.

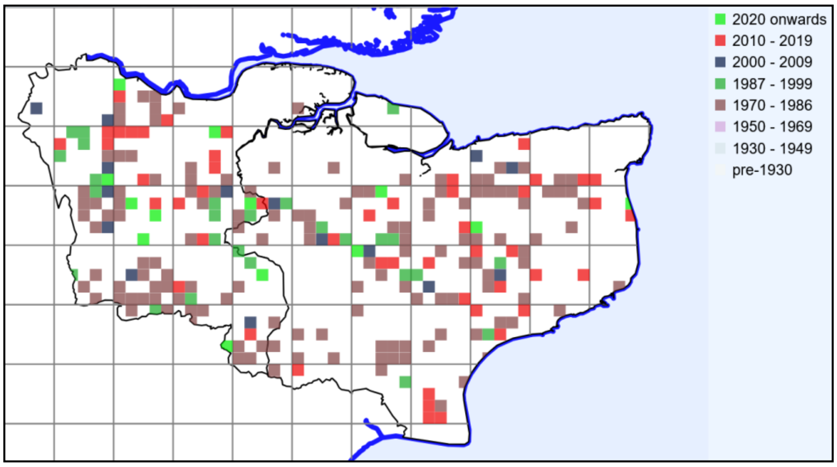
[812] Stevens, C.J. Kentish Sites and Sites of Kent. A miscellany of four archaeological excavations. Charred plant remains from the route of the Weatherlees – Margate – Broadstairs wastewater pipeline.

[813] Smith, W. Charred plant remains. In (eds.) Wheaton, K., Hardy, A. & Norton, A. Excavations of Bronze Age, Roman and Medieval Settlement on land at Wingfield Bank, Northfleet, Kent 2008.

[814] Davies [sic], A. (2006). The charred plant remains from Cuxton, Kent. CTRL specialist report, London and Continental Railways. Accessed via Archaeology Data Service (distributor).

[815] Stevens, C. (2006). The charred plant remains from Saltwood Tunnel, Kent. CTRL Specialist Report. London and Continental Railways.

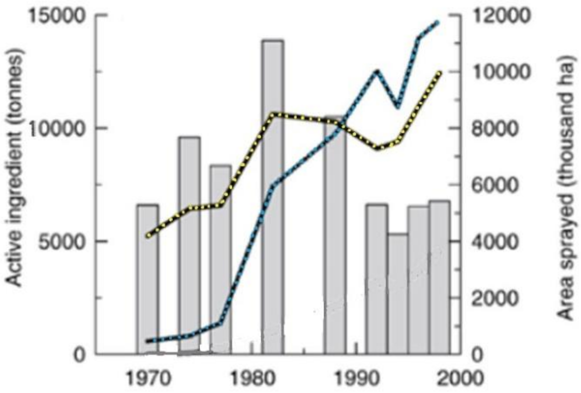
[816] Conolly, A.P. (1941). A report of plant remains from Minnis Bay, Kent. VII. Data for the study of post-glacial history. *New Phytologist* **40**: 299-303.



***Spergula arvensis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

However, the wide extent of records elsewhere in the county which Francis Rose found and which is also evidenced by the183 tetrad records given in Philp (1982) for 1971-80 has since become drastically depleted. Only 51 tetrad records were given by Philp (2010) for 1991-2005, with the suggestion that changes in farming practice were a probable cause. This does not seem to be an artefact of the Philp (2010) recording process: our 2010-24 records amount to only 62 tetrads (68 monads), so the position is comparable. Indeed, as five 2010-24 tetrads were within the Greater London boundary and so excluded from Eric Philp's surveys, there is not a great deal of difference between the number of tetrad records for Kent administrative county made in 2010-24 as compared with 1991-2005. They are not necessarily in the same places, but it looks as though the level of loss has stabilised somewhat after the major losses of the 1980s.

Farming changes over the 1980s included increases in autumn-sown cereals and in the application of herbicides. The former is less significant for *Spergula arvensis*, as it germinates in spring, but may still result in shorter periods for fruiting before the ground is ploughed. However, increased herbicide applications are likely to have been a material factor. The accompanying chart, adapted from Robinson and Sutherland (2002)[817], gives in bars and left axis the weight of herbicide applied in England and Wales; the yellow dotted line and right axis give the area sprayed with herbicide; and the blue dotted line and right axis give the area sprayed with fungicide. The bars show a strong increase in the amount of herbicide applied leading up the 1980s, reducing after 1990. This may give some explanation for the scale of losses of *Spergula arvensis* in the 1980s, although not ruling out the possibility that particular herbicides in use then may have been especially effective against the species.



Although it is primarily an arable plant, we have also recorded it on sandy golf course land and around rabbit diggings at Sandwich Bay; on a Canterbury roadside where soil had been disturbed by development; on a hay field margin; in an old sand quarry at Addington; on a rubble mound at Barnehurst golf course; and abundantly on the draw-down margins of Bewl Water reservoir. It also appears regularly in flower- and vegetable-beds in a Halstead garden, which were arable fields until the mid-1960s.

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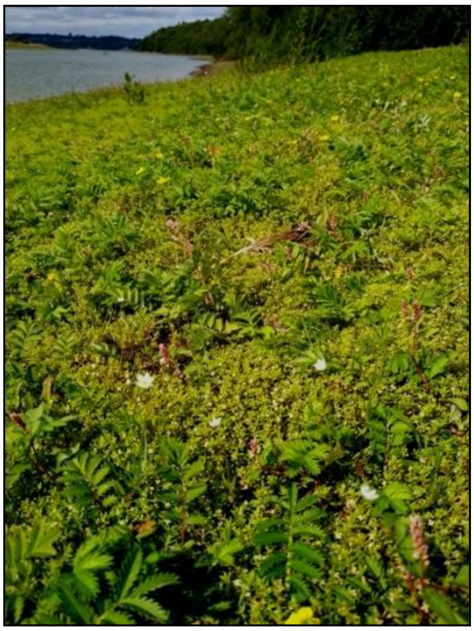
[817] Robinson, R.A. & Sutherland, W.J. (2002). Post-war changes in arable farming and biodiversity in Great Britain. *Journal of Applied Ecology* **39**: 157-176.

Typical habitat, Upper Goldstone. Photo by Mel Lloyd, 13 July 2016

An atypical habitat, Bewl Water reservoir. Photo by Sarah Kitchener, 4 September 2020



It is never a member of a closed community, and New (1961)[818] describes the species as showing no particular association with any one crop. Our recent records have been made in crops of maize, sunflowers, hops, broad beans, wheat, barley, flax, rhubarb, onions, melons and courgettes. So far as concerns associations with other species, we have noted it with *Persicaria maculosa* (Redshank) near Covet Wood; with *Stachys arvensis* (Field Woundwort) near Selsted, Swingfield Minnis; with *Stachys arvensis* and *Kickxia spuria* (Round-leaved Fluellen) above Temple Ewell; with *Papaver rhoeas* (Common Poppy) at Sandwich Bay; with *Gnaphalium uliginosum* (Marsh Cudweed) and *Juncus bufonius* (Toad Rush) near Bean; and with *Crassula helmsii* (New Zealand Pigmyweed) and *Potentilla anserina* (Silverweed) at Bough Beech reservoir. New (1961) considered the most frequent associates in a sample of arable across the British Isles to be: *Stellaria media* (Common Chickweed), *Polygonum aviculare* (Knotgrass), *Persicaria maculosa* (Redshank), *Persicaria lapathifolia* (Pale Persicaria) and *Chenopodium album* (Fat-hen).

Its preference for sandy soils is shown on the tetrad distribution map by the degree of coincidence with the Thanet, Tunbridge Wells Sand, Folkstone and Hythe Formations and the Lambeth Group, but there is a wider scatter elsewhere, and we have recorded it on clay-with-flints.

Spergula arvensis is an annual spreading by seed which germinates mostly from mid- to late April, later if seeds are brought to the soil surface subsequently by cultivation, flowering at eight weeks afterwards with first seed production following in a fortnight or so. The flowers never open before about mid-day. Seed viability in the soil is affected by the depth of burial and less than 1% remained viable after 9.7 years in Alaskan experiments[819]; a viable seed has been found in the soil of pasture which was arable 50 years before[820], but this does not suggest a remaining seed-bank of material size.

Four infraspecific taxa are recognised, variously treated at subspecific or varietal level. These are var. *arvensis* (= *vulgaris*) with papillate seeds; var. *nana*, a dwarf form from the Channel islands also with papillate seeds; var. *maxima*, also with papillate seeds but which are slightly larger, as are the capsules; and var. *sativa* with smooth seeds. New (1961) claimed that the frequency of the varieties followed a cline, so that var. arvensis was the predominant form in the south of the British Isles. Hanbury & Marshall (1899) gave records for the first and last of these varieties. Var. *sativa* has also been recorded at Knockholt (1941) and Pembury (1943);

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[818] New, J.K. (1961). Spergula arvensis. Biological Flora of the British Isles. *Journal of Ecology* **49**: 205-215.

[819] Conn, J.S. & Deck, R.E. (1995). Seed viability and dormancy of 17 weed species after 9.7 years of burial in Alaska. *Weed Science* **43:** 583-585.

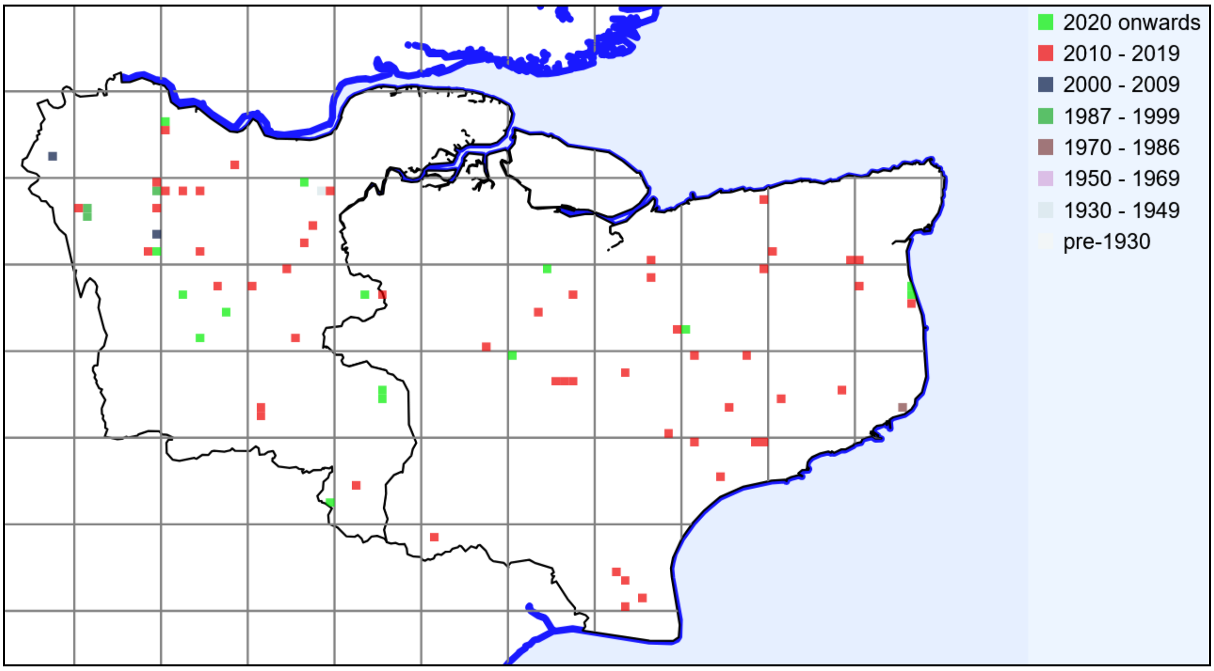
[820] Chippindale, H.G. & Milton, W.E.J. (1934). *Journal of Ecology* 22: 508-531.

and var. *arvensis* (*vulgaris*) at Dodhurst Farm, Hawkenbury (1944). Our only recent records are for var. *arvensis*: over 60 plants on disturbed soil from a newly planted orchard at Dawes Farm, Mount Ephraim, Hernhill (TR 06472 60427, Lliam Rooney, 15 November 2011) and plants in a sandy waste area near Swanley (TR 5003 6847, Rodney Burton at an LNHS meeting, 30 May 2015).

The conspicuous whorled clusters of linear leaves render *Spergula arvensis* conspicuous and unlikely to be confused with other British plants.

Hernhill. Photo by Lliam Rooney, 6 June 2012

***Spergula arvensis* Kent records to 2024**
mapped at monad level,
from BSBI database.



Rare plant register data for this species is being maintained at monad resolution, as given in the accompanying distribution map. These records are almost entirely from 2000 onwards, primarily 2010-24.
Previous recording was, at least from the 1970s, at tetrad level, and this is why the earlier distribution map was given in tetrads, so as to be able to compare trends over time.

Spiranthes spiralis (L.) Chevall. (Autumn Lady's-tresses)

vc 15 and 16

Rarity / scarcity status

Spiranthes spiralis is an orchid locally frequent in the southern British Isles, mostly on chalk or limestone. It is, however, considered to be **Near Threatened**, as a comparison over the periods 1930-1969 and 1987-1999 showed that its area of occupancy in England had declined so that there was a calculated 27% reduction in the likelihood of recording the species. In Kent, there appears to be evidence of a decline in records of 35% as between 1971-80 and 1991-2005, but this is not borne out by subsequent records which indicate an increase instead; the orchid is often irregular in appearance and perhaps unreported from private lawns, so that its continuance is not always readily assessed. Whilst very scarce in West Kent, it is across the county as a whole uncommon, but neither rare nor scarce. It is a Kent axiophyte and so is indicative of good habitat.

Lydden reserve. Photo by Lliam Rooney, 4 September 2010

Account

The first published notice of this species in Kent is by Edward Jacob in his *Plantae Faveshamienses* (1777): '*In* Ospringe Parsonage *Meadows – uncommo*n'. Another early record is that of G.E. Smith, who recorded it 'Upon turfy ground, above the shore between Sandgate and Folkestone; and at the foot of the chalk downs above Newington, upon Folkestone-hill, &c. abundant' (*A catalogue of rare or remarkable phaenogamous plants, collected in South Kent*, 1829).

It was frequent on downs and in chalk-pits and old pastures, according to Hanbury & Marshall (1899), although some of the records which they cited were on sand or gravel, e.g. sandpits between Greenwich and Woolwich (Cooper, 1835), Dartford Heath (Pamplin, 1835) and Keston Common. Thomas Forster's record in *Flora Tonbrigensis* (1816) is omitted by them, also on sand: ('In meadows, pastures, and heaths…by the sides of the path over the Common to the Wells from Vale Royal, and elsewhere'), but presumably this is because it was in one of the botanical districts where the orchid was sufficiently frequent that records did not warrant individual mention. Chalk is a more usual habitat, and Anne Pratt, a Dover resident, mentioned that 'On some of the grassy hill-sides of Dover it is common'[821].

Francis Rose described it in Kent as a native of dry short grassland, frequent locally on the chalk, rare and scattered elsewhere, but often abundant in its localities, sometimes appearing suddenly in quantity on garden lawns. He listed some 53 sites, some historic, most from the 1930s to the 1960s, and the highest number of plants given being 100 at Cliffe chalk pit, where the species was known from 1945 to 1962. During the Kent Field Club's 1971-80 survey (Philp, 1982), *Spiranthes spiralis* was recorded as being rather local and uncommon, in grassy areas on downland, damp meadows and coastal dunes, and at times on garden lawns and grass tennis courts: a total of 31 tetrads. In Eric Philp's 1991-2005 survey (Phip, 2010), however, it was only recorded from 20 tetrads, but with this caveat: 'The number of plants showing each year is very variable and much dependent on how much rainfall there has been earlier in the year. Also the sites where this plant grows are often those that are regularly mowed, which tends to make recording very difficult, and the real distribution is likely to be wider than that shown'. This seems a very appropriate qualification given that our 2010-24 records amounted to 52 tetrads (equivalent to 67 monads) so the species appears far from being in decline, considered on the basis of tetrad numbers. The low numbers in the 1991-2005 survey may also be in part be attributable to this being a solo recorder survey, whilst the earlier and later record sets are both crowd-sourced, the earlier by the Kent Field Club, the later by the Kent Botanical Recording Group.

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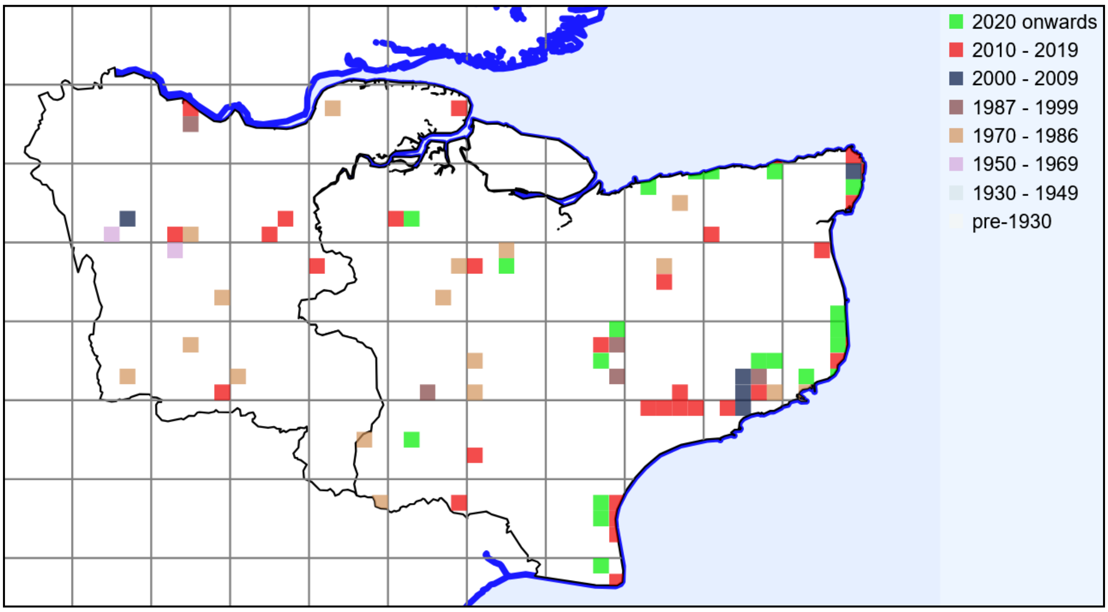
[821] Pratt, A. (1873) *The Flowering Plants, Grasses, Sedges, and Ferns of Great Britain*, vol. 5. She also referred to finding it in profusion in dry meadows around Tunbridge Wells, presumably a sandy locality, perhaps coming to her attention after moving to East Grinstead in 1866.

The accompanying distribution map shows the spread of these records, with 2010-24 sightings particularly focused on the east Kent coastal chalk on Thanet (North Foreland to Ramsgate) and from Kingsdown to Folkestone; the North Downs running inland from Dover; and the consolidated sand/shingle of Littlestone / Greatstone and Dungeness. Although these records may be construed as a 68% increase over the 1971-80 position, the distribution map shows that there are nine 10km squares which had records in 1970-86 (and so including the 1971-80 survey) but which do not have records since. This appears to suggest a contraction of range; however, it would better be viewed as a variation in range, as we have since offset this by finding the plant in 'new' 10km squares. While seed dispersal, which is by wind, has been observed experimentally to be limited mostly to within a couple of metres of the parent plant, it is apparent that seed is capable of reaching new habitats from a distance. (Germination and development of course require the presence of appropriate mycorrhizae at the new habitat.)

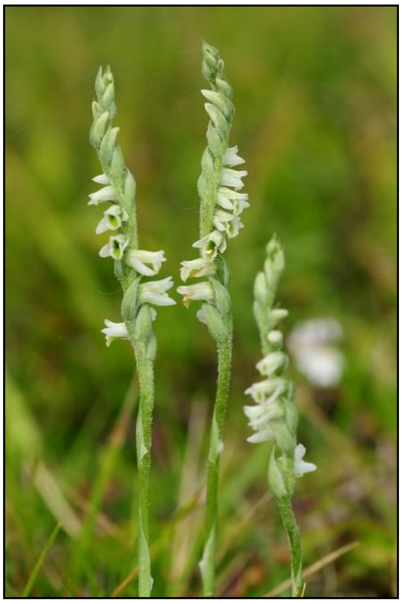


Spiranthes spiralis **Kent records to 2024 mapped at tetrad level, from BSBI database.**

The largest colonies in recent times appear to be those at:

- Ramsgate cemetery, c.100 flowering spikes in 2020;
- Former Joyce Green hospital site, Dartford, over 100 spikes in 2012;
- Dungeness, 136 spikes on short turf on consolidated shingle in 2019;
- Kingsdown, Oldstairs Bay, 150 spikes on lawn on chalk in 2010;
- Littlestone, Madeira Road, over 100 spikes on short mown turf on sandy ground in 2016; records in 2006 along lawns and verges noted densities ranging from ten to over 500 spikes per 20 x 20m square;
- Stodmarsh national nature reserve, 170 flowering spikes on colliery spoil in 2014;
- Kingsdown chalet park, est. 200 plants on chalk grassland slopes, reckoned from surviving spikes and taking account of where mown off, in 2015;
- Kingsgate, Castle House, est. 200 spikes in private grounds, coastal on chalk, in 2010;
- St Margaret's at Cliffe, est. 200 spikes in short chalk turf around war memorial in 2010;
- North Foreland, Cliff Promenade, mown verges and lawns including one with at least 300 flowering spikes in 2013;
- Benenden Hospital grounds, 344 spikes in grass over Tunbridge Wells Sand Formation in 2013;
- Chestfield church lawn, 430 spikes in relict neutral grassland on London Clay, possibly with Head deposits overlay (known also for *Anacamptis morio*, Green-winged Orchid) in 2013;
- Postling, several hundred flowering spikes on chalk downland in 2013;
- Shuttlefield Down,at least 300 spikes on chalk downland in 2013;
- Walmer, two sites, one with 102 spikes, the other 410, in 2023;
- Birchington, c.1,200 spikes in cliff-top chalk grassland in 2015;
- Kingsdown, The Leas, at least 1000 spikes on lawn of cliff-top house, on chalk, with as many again seen on the grass verge outside (but mown off) in 2013; in 2024, 10,040 spikes.

Note that counts of flowering spikes are just that, and the true number of plants should be higher because of non-flowering plants, including those which are dormant underground (the mean percentage of emergent plants which flower in a season may be in the 30s).[822]



Lydden reserve. Photo by Lliam Rooney, 4 September 2010

These major colonies confirm preference for short turf, generally on chalk, but also less frequently on other substrates, especially where well drained (Chestfield appears anomalously damp, however). There have been losses in the past: Francis Rose listed sites from the 1950s for which there are no current records, including downland which has been ploughed out or 'improved', and David Johnson (*Wild Orchids of Kent*, 2019) refers to chalk pits with plants in the 1970s and 1980s which have since suffered from scrub encroachment. Any withholding of grazing may well have brought about the same result elsewhere, but against this one must offset the effect of the availability of lawns and verges which provide the short turf needed to enable sufficient light to reach the orchid rosettes which lie very close to the ground surface.

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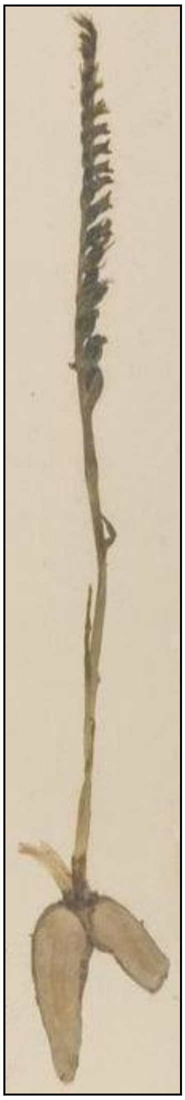
[822] Data from Bedfordshire and Dutch populations gave means of 32.9% and 37.6%, but with wide annual variation.



Spiranthes spiralis with tubers, collected by W.H. Griffin, September 1903. 'Until '03 plentiful in meadow opposite the "Fox," Keston, now being covered with cottages and gardens' (*Woolwich Surveys*, 1909).

The rosettes sit sufficiently low to avoid grazing, whether by stock or rabbits, and Bedfordshire studies indicate that the risk of grazing damage to plants is to the inflorescences (August to September flowering; October to November fruit development), a loss of 30% of the inflorescences having been observed with sheep grazing at a density of ten per hectare.[823] This does not necessarily imply loss of the plants, since the underground tuber remains. Normally each year, the tuber is replaced by at least one new tuber, so that two are present: the new one which will produce next year's growth and the old one, which becomes exhausted and shrivels up. Sometimes, however, only a part of the old tuber's reserves are exhausted and such tubers can last for several years[824]. We have not been able to trace any literature on the potential for the tuber whose inflorescence is removed by grazing or mowing to continue as perennial given that its resources are no longer being applied to flowering and fruiting. A number of our records recognize that mowing takes place and flower spikes are lost in consequence. However, the loss of opportunity of reproduction and dispersal by seed may receive some compensation through limited vegetative spread by the growth of a lateral bud on the underground stem to produce a new plant which forms its own tubers, and eventually becomes fully separate.

Kingsdown ranges, habitat of coastal species-rich turf on chalk, although becoming a little overgrown. Photo by David Steere, 26 August 2018.

Rare plant register data for this species is being maintained at monad resolution, as given in the accompanying distribution map. These records are almost entirely from 2000 onwards, primarily 2010-23. Previous recording was, at least from the 1970s, at tetrad level, and this is why the earlier distribution map was given in tetrads, so as to be able to compare trends over time.

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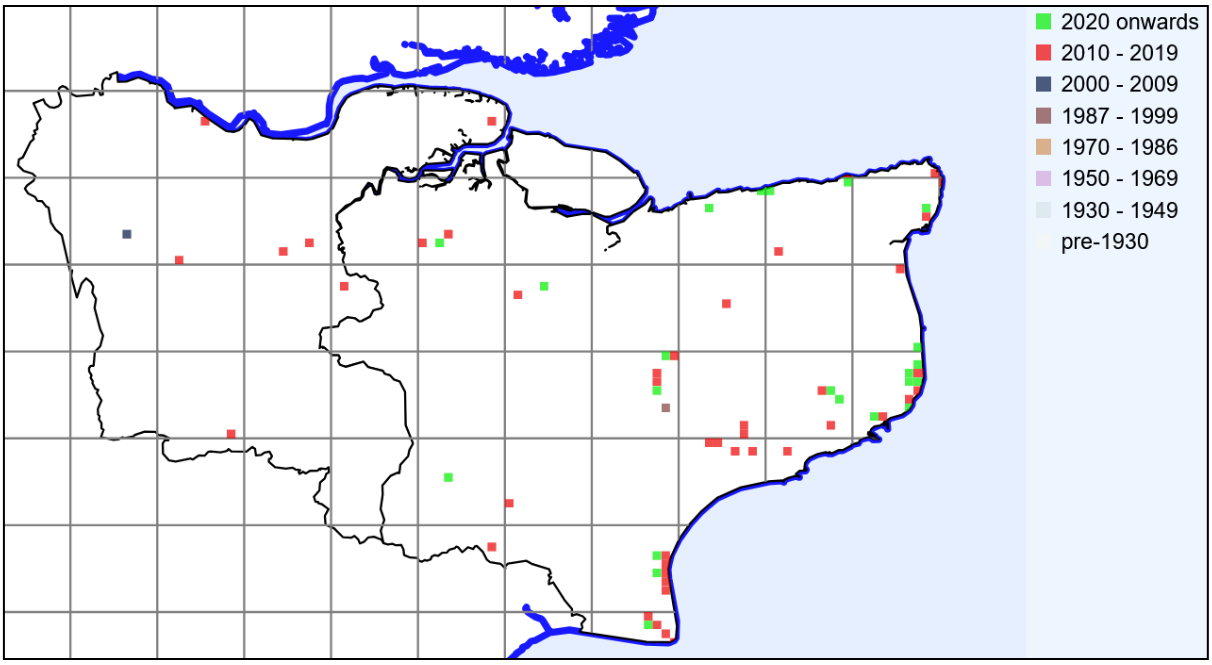
[823] Wells, T.C.E. (1967). Changes in a population of *Spiranthes spiralis* (L.) Chevall. at Knocking Hoe National Nature Reserve, Bedfordshire, 1962-65. *Journal of Ecology* **55**: 83-99.

[824] Hutchings, M.J. (2010). Biological Flora of the British Isles: *Spiranthes spiralis* (L.) Chevall. *Journal of Ecology* **98**: 1253-1267.

Spiranthes spiralis **Kent records to 2024 mapped at monad level, from BSBI database.**

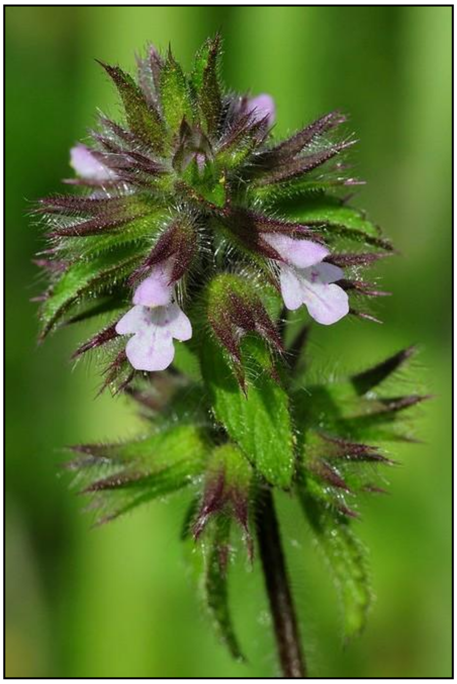

2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Stachys arvensis (L.) L. (Field Woundwort)

vc 15 and 16

Rarity / scarcity status

Stachys arvensis is an archaeophyte or ancient introduction of cultivated and waste ground, scattered across much of the British Isles. It is considered to be **Near Threatened** in both England and Great Britain as a whole. A comparison of English records over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 30% reduction in the likelihood of recording the species. In Kent, In Kent, there is evidence of a decline in records of 79% as between 1971-80 and 1991-2005, and although it is as yet neither rare nor scarce, the decline is concerning. It is a Kent axiophyte and so is indicative of good habitat.

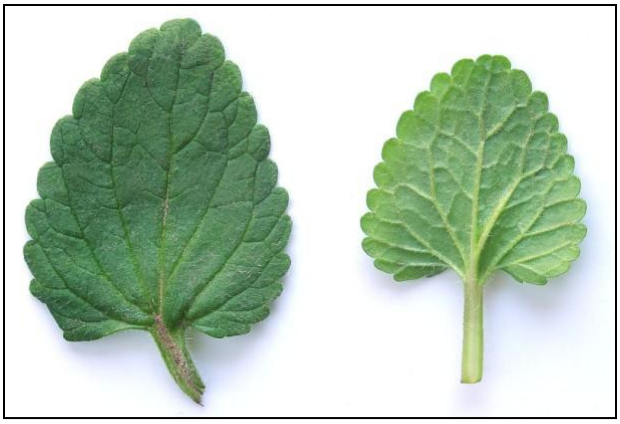


Near Lynstead. Photo by Lliam Rooney, 2014/15

Account

The first records of the species, in Kent and in the British Isles, are by Thomas Johnson. He mentions it as found between Margate and Sandwich in his *Descriptio Itineris* (1632), but it was a plant already familiar to him as he refers to it also in his 1633 edition of John Gerard's *Herball*: 'I first found it in August 1626 in floure and seed amongst the corne in a field joining to a wood side not far from Greene-hive [Greenhithe] in Kent'. Up to the twentieth century it was clearly widespread and common. Hanbury & Marshall (1899) gave no records other than Johnson's, because of its ubiquity: 'Fields and waste ground; common throughout the county'.

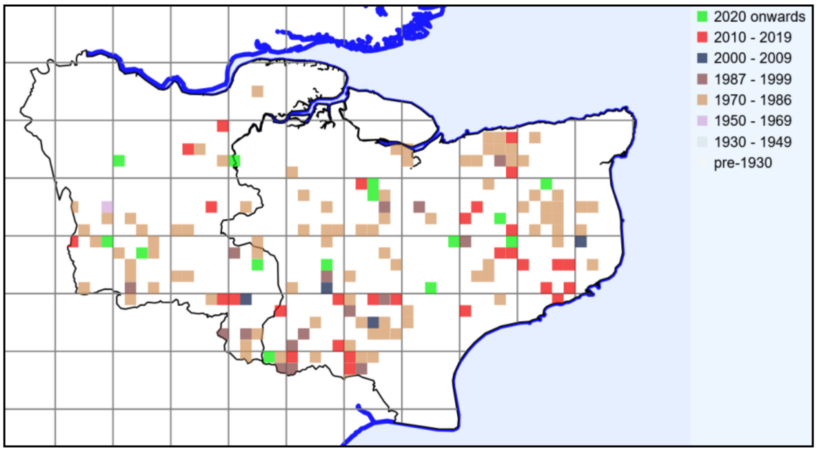
By the 1950s-60s, it looks as though that distribution was being perceived as a little more patchy. Francis Rose in his manuscript Flora of Kent noted it in 'Cultivated fields on a variety of soils, particularly on chalk and sand: widespread, but sparsely distributed and only common locally, particularly in the eastern Weald about Ashford..., and the east Kent chalk..., rather rare in W. Kent'. This last comment is not wholly borne out by the Kent Field Club's 1971-90 survey (Philp, 1982), which, although yielding almost total absence in north west Kent, found many records in the south west. Overall, *Stachys arvensis* was then described as rather local and uncommon in arable fields and waste ground, but still present in 108 tetrads.



From near Lynstead. Photo by Lliam Rooney, 2014/15

The position in 1991-2005 (Philp, 2010), however, ostensibly appears to be one of major decline, down to only 23 tetrads. The decline seems overstated, given that our 2010-24 records cover 43 tetrads (nearly equivalent to the number of monads, 44, which suggests a very scattered distribution, nowhere concentrated). But even a decline from 108 to 43 tetrads is severe, and there seems to be a parallel with other arable weeds, such as *Spergula arvensis* (see its species account above, where its decline in the 1980s is related principally to increased herbicide applications).

Stachys arvensis Kent records to 2024 mapped at tetrad level, from BSBI database.



The accompanying distribution map shows the decline clearly. Some of the 2010-24 records will overlap and obscure those for 1987-99 and 2000-09. The great majority of squares depicted are for 1970-86, and all bar one of these are squares recorded for Philp (1972) and so fall within the earlier part of the range, after which changes in farming practices apparently have fuller effect.

Near Lynstead. Photo by Lliam Rooney, 2014/15

Stachys arvensis is a spring-germinating annual with a long flowering period (April to November). In Kent cultivated land there does not seem to be any particular crop association other, perhaps, with game bird food sowings (which are, of course, not usually subjected to herbicidal treatment): we have recorded it otherwise with maize, cereals, broad beans and flax; also in orchards and a newly planted hop field.

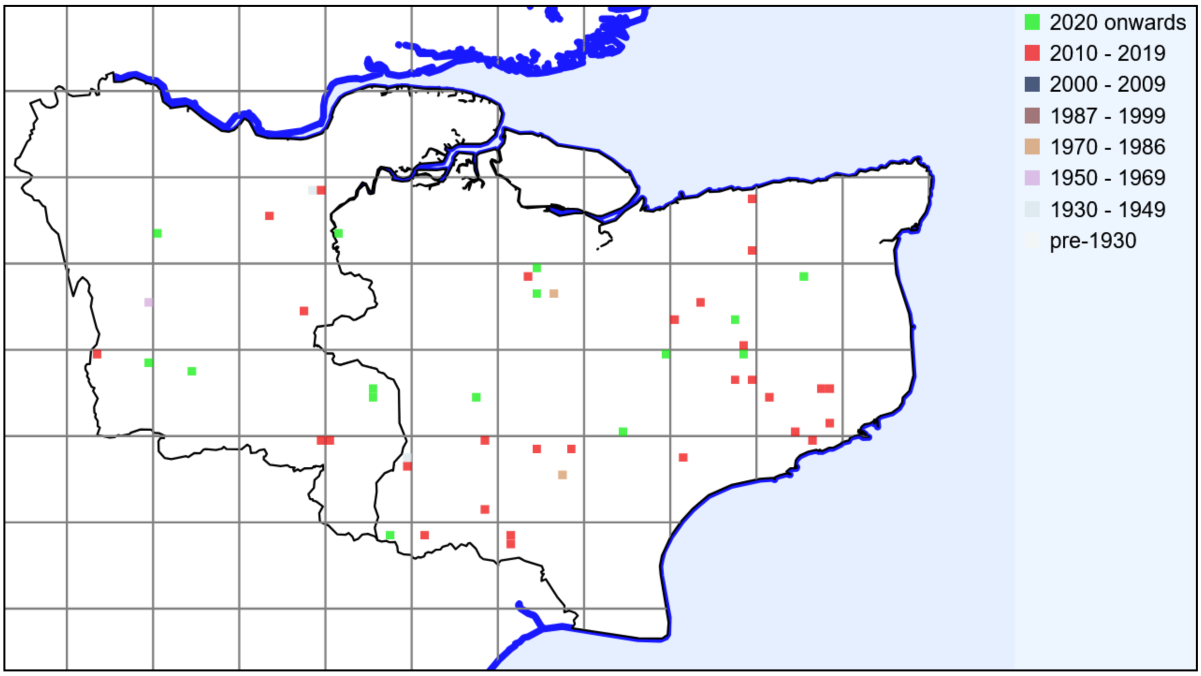
Where we have noted the geology, it has been non-calcareous, e.g. Weald Clay, sandy clay, sandy head (although ragstone at the last site may have modified the acidity) and even in a case where the site was clearly a chalk valley slope, the nearby presence of *Pteridium aquilinum* (Bracken) suggested possible downwash of less basic soil (drift or clay-with-flints). An exceptional habitat was noted in 2022, when it was found to be plentiful with the weed flora in the draw-down zone of Bough Beech reservoir. Most of our records are without counting numbers, and the highest we have noted is about 100 in a flax crop near Capel-le-ferne in 2019 and colonies of over 40 and 50 north of Doddington in 2014.

Bough Beech reservoir. Photo by Geoffrey Kitchener, 28 September 2022

A characteristic of the Kent *Stachys arvensis* sites is that plants are sometimes accompanied by other ‘high quality’ arable weeds: *Ranunculus arvensis* (Corn Buttercup) near Headcorn in 2019, *Silene noctiflora* (Night-flowering Catchfly) near Doddington in 2015, and *Spergula arvensis* (Corn Spurrey) above Temple Ewell in 2017.

Rare plant register data for this species is being maintained at monad resolution, as given in the accompanying distribution map. These records are almost entirely from 2000 onwards, primarily 2010-23. Previous recording was, at least from the 1970s, at tetrad level, and this is why the earlier distribution map was given in tetrads, so as to be able to compare trends over time.

Stachys arvensis **Kent records to 2024 mapped at monad level, from BSBI database.**



Stachys arvensis in some degree resembles *Clinopodium ascendens* (Common Calamint), although they are normally in different habitats and the Calamint is a perennial, but the odour of the leaves when crushed is very different: musty and foetid in the former, aromatic and minty in the latter.

Suaeda vera Forssk. ex J. F. Gmel. (Shrubby Sea-blite)

vc 15; gone from vc16

Rarity / scarcity status

Suaeda vera (Shrubby Sea-blite) is a perennial shrub which grows as a native sparsely along the coasts of south and east England, on shingle beaches beyond normal tidal reach, the drift line at the base of dunes, edges of tidal creeks and upper saltmarshes where the substrate becomes sandy or shingly. It is **nationally scarce**, but in England its risk assessment is one of 'Least Concern'. In Kent it is **very scarce**.

Lydd. Photo by Lliam Rooney, 28 June 2011

Account

Grain. The first Kent record for Shrubby Sea-blite appears to be a specimen at the University of Reading herbarium collected by Ted Lousley on 30 June 1935 on the Isle of Grain, near Grain Fort. It has not been recorded there since. *Suaeda vera* seeds spread by water and are washed up and accumulate amongst drift-line litter, germinating in spring; vegetative fragments detached by storms may also be capable of establishing as new plants.[825] There is also evidence that seeds may survive ingestion by birds such as mallard and grey-lag geese[826], although north Kent plants generally appear more likely to derive from drifted seed than bird-borne seed. With drifted seed, there is always the possibility of a 'come and go' site such as this arising.

Lydd. Francis Rose in his manuscript *Flora of Kent* noted a report that the Lydd Ranges warden planted it; Rose was aware of it in 1947 as being well naturalised and spreading round a salt-water lagoon at the Midrips on muddy shingle. The administrative county boundary runs east of the Midrips and the colony was thought to be in vc14 East Sussex, but the vice county boundary is separate and does not take in any of Lydd Ranges, so this is all in vc15 East Kent. The table below gives a selection of records for this site, or complex of sites spreading across six monads. The spread of *Suaeda vera* here is facilitated by not being directly exposed to the sea, so that seeds are generally retained within the area, but its habitat is affected by saline seepage and varying potential for sea incursion. Plants are located both inland and seaward of the green wall, which is a secondary sea defence barrier of clay. They grow in hollows, which may be winter-wet, and at the margins of saline lagoons, on shingle with clay and/or peat. Where numbers are recorded, they tend to be individual plants or small groups, but there are a couple of sightings of over 100 plants, seaward of the green wall.

Upchurch peninsula. *Suaeda vera* was recorded by Eric Philp in 1964 at TQ86P near Ham Green, at the tidal River Medway estuary. This is mentioned by Philp (1982) as having since gone.

Shellness, Sheppey. On 13 January 2005, Eric Philp and Doug Grant found it at the shell sand beach at the south eastern end of Sheppey, a location which appears very suitable for the deposit of drifting seeds. Further recording in 2010 noted the presence of one large bush together with three small ones two to eight metres distant. More than one seed stranding event seems improbable, and the small plants were taken to be seedlings from the original large one. On a visit in January 2019 it was found that the top of the beach had been cut into by at least one exceptionally high tide and all plants appeared to have been swept away.

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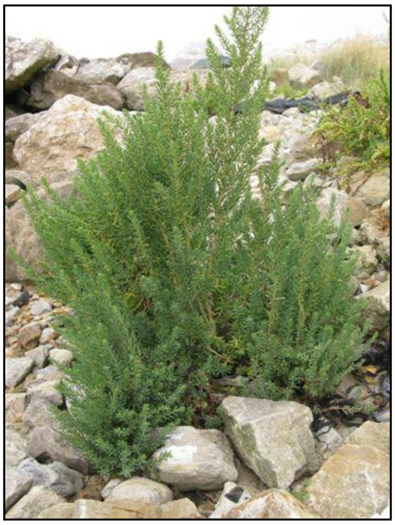
[825] Leach, S.J. (1994). *Suaeda vera* Forsskål ex J. Gmelin Shrubby sea-blite. In (eds.) Stewart, A., Pearman, D.A. & Peston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough.

[826] Garcia-Alvárez, A. et al. (2015). Internal transport of alien and native plants by geese and ducks: an experimental study. *Freshwater Biology* **60**: 1316-1329.

Reculver. Photo by Sue Buckingham, 29 July 2010



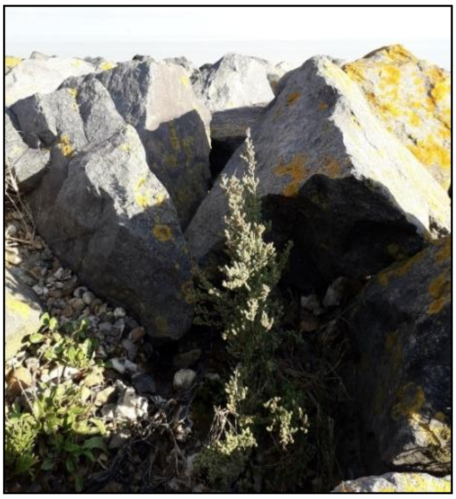
Reculver. A plant about 2m tall was found by Sue Buckingham on 29 July 2010 growing on the shingle beach with coastal defence rocks, at the foot of the clay cliffs. This is an area subject to erosion generally, and in early October 2013 the bush was found to have been bent over but had re-rooted, remaining healthy and producing fruits. The storm of 10 October 2013, however, washed the plant away.

Birchington. A bush was found by Colin Osborne in 2010 growing at the back of the sea wall defences forming a promenade at Birchington, TR 29354 69967, at the foot of the chalk cliffs; this would be in the spray zone in some weather/tidal conditions, but not ordinarily within reach of tides. It was still present in June 2021.

Birchington Photo by Colin Osborne, 20 July 2020

Beltinge. A further bush was discovered by Colin Osborne in April 2020 (still present, 2022) on shingle amongst sea defence boulders deposited on the upper beach at some time between 1990 and 2003. The boulders are capable of trapping seeds and other material from the tides and the bush is located high enough up the beach for a sparse drift line flora including *Beta vulgaris* subsp. *maritima* (Sea Beet) to be present.

Beltinge. Photo by Colin Osborne, 24 June 2020



Accordingly, in Kent there is a pattern of infrequent appearance of individual plants along the northern coast, presumably from seed borne on very high tides. While such plants may produce seeds to spread further along the coast (although only one case of proximate seedlings has been reported), otherwise the nearest potential parent colonies appear to be those in Essex, the Rivers Crouch and Blackwater estuaries. *Suaeda vera* exhibits a preference for fairly well-drained habitat, whether silt or shingle, and has great power of rejuvenation by the development of roots and shoots from shingle-buried branches [827]. The flowers do not appear insect-attractant, but are hermaphrodite and apparently capable of self-pollination or wind-pollination. They open between mid-July and October, with fruits being dispersed from September to early November and germination taking place from March.

Although we have limited information about associated species in Kent (and *Suaeda vera* appears to grow where very little else does), there are two species of similar habitats with which it might be confused. One is *Suaeda maritima* (Annual Sea-blite) which differs by being an annual, less woody at the base and has two stigmas (*Suaeda vera* has three or five). The other is *Limbarda crithmoides* (*Inula crithmoides*, Golden-samphire), a perennial with a woody stock, totally different when in flower, and bearing succulent leaves which are 2–4.5cm long or more; those of *Suaeda vera* are normally 0.3-0.7cm, and although variants with leaves 0.5-1.1cm long may occur, we do not have Kentish data for these.

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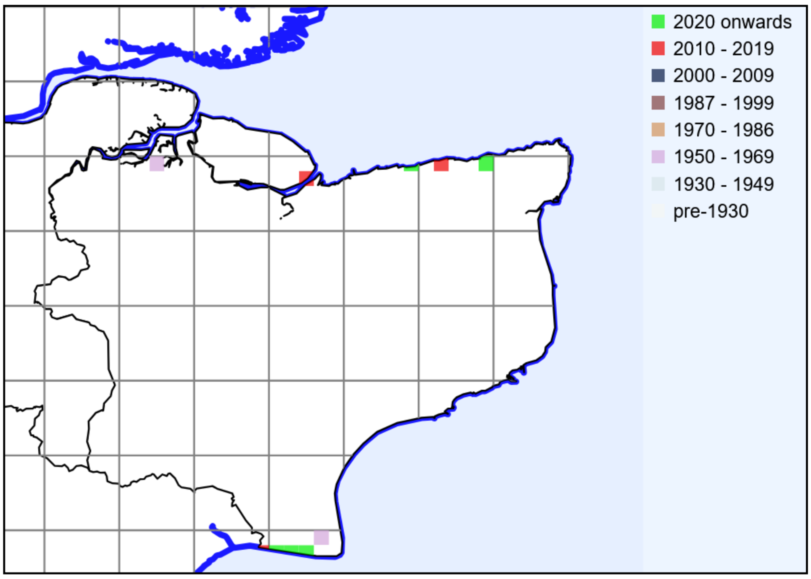
[827] Chapman, V.J. (1947). Suaeda fruticosa Forsk. (Biological Flora of the British Isles), *Journal of Ecology* **35**: 303-310.

Overall, our 2010-24 records amount to eight tetrads (10 monads).

Lydd. Photo by Lliam Rooney, 28 June 2011



***Suaeda vera* Kent records to 2023 mapped at tetrad level, from BSBI database.**

Site	Grid reference	Site status	Last record date	Recorder	Comments
Lydd Ranges west	TQ9917	MOD property, SSSI	(1) 9 August 2013 (2) 7 August 2012	(1) OL, GK & TI (2)OL, GK, TI, SB	(1) Landward of sea wall, TQ 99900 17936. (2) Below Green Wall at TQ 99897 17939.
Lydd Ranges-Midrips and The Wicks	TR01D, includes TR0017 & TR0117	MOD property, SSSI	(1) 19 August 2024 (2) 1 September 2017 (3) 9 August 2013 (4) 9 August 2012 (5) 30 May 1993 (6) 1999 (7) Before 1981, after 1970	(1) AL & RD (2) BBe (3) OL, GK & TI (4) TI (5) EGP & JBe (6) BBa (7) WJM	(1) (a) TR0117, Denge Beach. (b) TR0017, Denge Beach and hollow in Midrips. (2) (a) TR 00200 17864, western-most occurrence on site, a few plants. (b) TR 01217 17663, behind coastal embankment. (3) (a) Inland of green wall, TR 00584 17842, many plants in winter-wet hollow, shingle on peat. (b) Inland of green wall, TR 00653 17859, on shingle/peat by saline lagoon, one large plant and many smaller. (c) Inland of green wall, TR 00221 17894, plants on clay with shingle in and around a channel conducting sea water seeping through shingle into two shallow lagoons. (d) Between green wall and shallow lagoons, TR 00349 17870, on clay. (4) (a) TR 01357 17641 (furthest east before gap till TR0217). (b) TR 00093 17885 (furthest west). (5) TR 008 178, south of The Wicks. (6)TR 0112 1768, three plants on

					shingle. (7) Given in Philp (1982) as on county border, and so would be at The Wicks, TR0017 or TR0117.
Lydd Ranges-South Brooks	TR01I, includes TR0217 & TR0317	MOD property, SSSI	(1) 22 August 2024 (2) 1 September 2017 (3) 8 August 2012 (4) 7 August 2012 (5) 28 July 2006	(1) AL & RD (2) BBe (3) SB & TI (4) TI (5) EGP	(1) (a) TR0317, Denge Beach. (b) TR 0254 1741, Denge Beach. Sea purslane community. (2) (a) TR 03460 17240, several. (b) TR 03460 17240, several behind coastal embankment. (3) (a) 100+ plants south of Green Wall at TR 02232 17571. (b) By Wickmaryholm Pit, one large bush at TR 03391 17283, two more at TR 03451 17249, one at TR 03461 17237. (4) TR 02118 17486. (5) TR01I.
Lydd Ranges-Wickmaryholme	TR01N, includes TR0417	MOD property, SSSI	(1) 22 August 2024 (2) 9 August 2012 (3) 16 November 2007 (4) 28 June 1996	(1) AL & RD (2) TI (3) RG (4) EGP	(1) TR0417, Denge Beach. (2) TR 04392 17137. (3) TR 045 171. (4) TR01N.
Shellness, Sheppey	TR06N	SSSI, national nature reserve	[20 January 2019] (1) 19 January 2017 (2) 14 October 2010 (3) 3 June 2010 (4) 13 January 2005	[SB] (1) DC (2) SB (3) SP & DG (4) EGP & DG	[There is plenty of evidence from the way the top of the beach there has been cut into that there has been at least one exceptionally high tide and the entire bush, roots and all appears to have been swept away.] (1) Present. (2) TR 05227 67603, one large plant on shell sand beach, somewhat undermined by rabbits. Three small plants 2 to 8 ms distant appear to be seedlings.. (3) TR 05226 67605, one large plant and three small ones between large plant & blockhouse. (4) TR06N, one mature bush.
Beltinge	TR1968		(1) 19 July 2022 (2) 24 June 2020 &16 July 2021	(1) & (2) CO	(1) Plant on beach amongst rocks now well established. (2) One plant amongst sea defence boulders, beach below Beltinge Cliffs, c. TR 1976 6858.
Reculver	TR2269	SSSI	(1) 1 October 2013 (2) 16 October 2011 (3) 27 August 2011 (4) 29 July 2010	(1) CO (2) CO (3) DM (4) SB	(1) One plant just hanging on earlier in year, but appears to have re-rooted where bent over and looks healthy again with some fruits produced. Washed away by storm of 10th Oct 2013. (2) c. TR 223 693, one sizable plant on pebbly upper beach. [TR 223 692 would be closer.] (3) TR 22266 69212. [location should be just south of this grid reference.] (4) TR 22278 69195 on beach at foot of clay cliff, plant very woody at base, c2m tall, 3-styled.
Birchington	TR2969	SSSI	(1) 13 June 2021 (2) 20 July 2020 (3) 16 September 2013	(1) JG (2) & (3) CO	(1) Promenade/cliff base, Grenham Bay, TR 29354 69967. (2) One large bush still present, between the concrete surface of the promenade/sea wall and chalk cliff behind. (3) One large bush at base of cliffs on sea wall defences at c. TR 2929 6995: has been present, similar size, since first noticed in 2010.

Succisa pratensis Moench (Devil's bit Scabious)

vc 15, vc 16

Rarity / scarcity status

Succisa pratensis is a plant of grasslands of varied nature, wet or dry, calcareous or acid, and is widespread across the British Isles. Despite this ubiquity, its risk assessment in England is one of **Near Threatened**. A comparison of English records over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 20% reduction in the likelihood of recording the species. This may be related to loss of its wetter habitat on infertile soils with causes including eutrophication, loss of grazing and hydrological changes. There is also evidence of decline in Kent, although the species is as yet neither rare nor scarce in the county. It is a Kent axiophyte and so is indicative of good habitat.

Selling. Photo by Lliam Rooney, 12 September 2008

Account

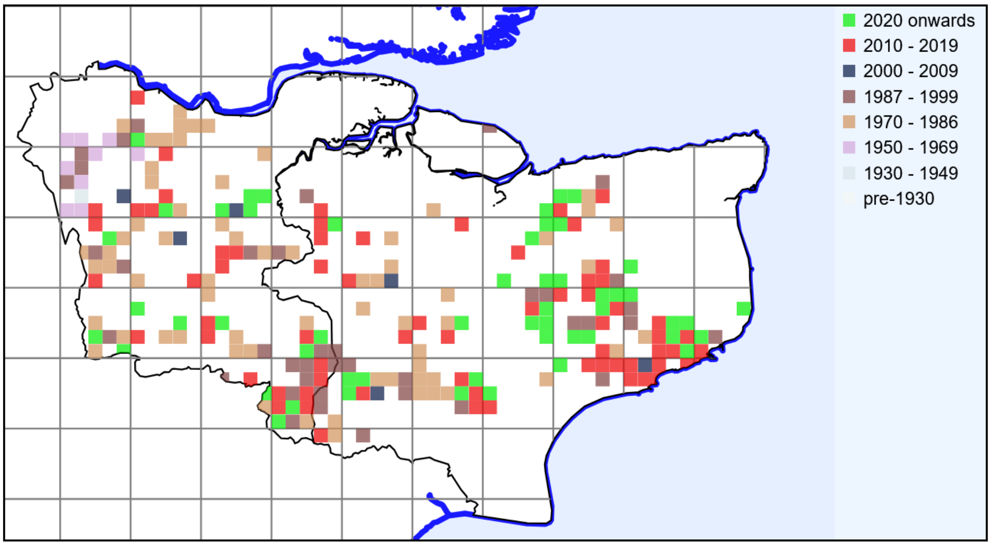
The first published Kent record is by John Parkinson in his Theatrum botanicum (1640): 'growing wild about *Apple dore*, neere *Rye* in *Kent*'. He introduces Devil's-bit by observing 'Fabulous antiquity (the Monkes and Fryers as I suppose, being the first inventors of the Fable) said, that the Devill envying the good that this herbe might do to mankind, bit away part of the roote, and thereof came the name *Succisa*, Devils bit, which is so grosse and senslesse a relation, that I merveile at the former times stupidity, to receive as true such a fiction'. The plant was regarded as so common by Hanbury & Marshall (1899), in pastures and woods, especially on clay and chalk, that they gave no records, other than Parkinson's.

Being so common, many other historic botanists did not mention it. Amongst those who did, Edward Jacob (*Plantae Favershamienses*, 1777) referred to it as *In* Bysing Wood *and the* Abbey Meadows – *common*'; Richard Deakin (*The Flowering Plants of Tunbridge Wells and Neighbourhood*, 1871) described as being in 'Meadows and on the forests, common'; and J.F. Bevis and W.H. Griffin give it in north west Kent as a plant of 'Woods, pastures, open spots in moist woods; v.com.' (*Woolwich Surveys*, 1909).

Winterbourne. Photo by Lliam Rooney, 22 September 2017

Francis Rose noted it as a native of chalk grassland, frequent in less dry places; meadows, grasslands, scrub, open woodlands and woodland paths on clay and Hastings Sands, very common; fens, meadows and valley bogs on peat, locally common. This wide range of habitats was echoed by Philp (1982), encompassing 'damp meadows, marshes and woodland rides, and at times on open downland on the chalk', locally frequent and found in 166 tetrads during the period 1971-80. By the time of the 1991-2005 survey (Philp, 2010), however, it was found in only 95 tetrads. The severity of this decline (43%) is perhaps overstated, in that our 2010-24 records amount to 120 tetrads (167 monads), which is 28%. Admittedly, three of those tetrads were in metropolitan vc16, outside the administrative county of Kent to which the Philp (1982 & 2010) surveys were confined, but this makes little difference. Accordingly, it appears that there has been a major decline since the 1970s, but one which has at least levelled off.

The causes assigned to the national decline (including eutrophication, loss of grazing and hydrological changes) may be relevant, but it is not straightforward analyzing these, because of the range of differing habitats, which would be affected differently by such causes. From the distribution map below, the 'losses' may be regarded as concentrated in several areas. The first of these is north west Kent (TQ45, TQ46, TQ47 and TQ57). The pre-1970 losses in TQ46 and TQ47 are in Greater London and probably relate to loss of habitat generally with urbanisation. The losses in TQ57 around Dartford may reflect general pressures on natural habitats. Those in TQ45 around Westerham would involve both chalk grassland and sandy terrain, also (Westerham Wood) Gault clay; there seems to be no single answer for causation of loss, and there may be some under-recording. This is also possible as regards Wealden woodland and meadows in TQ73, TQ83 and TQ84: Bedgebury through to Hemsted Forest and thence east of Tenterden, even though there are areas which have been well worked in 2010-21, and the species re-found. It may be that these are losses relating to agricultural 'improvement' of grassland. There is also a line of formerly recorded tetrads from the east end of Mereworth Woods running past Oaken Wood to Barming Heath which probably represents currently under-recorded woodland habitat.



***Succisa pratensis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Succisa pratensis can spread vegetatively by rosettes forming on the longer stolons, or by lateral shoots, including those formed where a flower stem is checked early in its development[828]. However, the usual means of reproduction is by seed. Flowering is relatively late, generally from August and continuing into September and October, and seed dispersal by wind takes place only over short distances. The seeds are plumeless and their ability to be dispersed by wind relies on being carried in the dry, hairy and persistent calyx which adds surface area without much weight, and the flowering stems, up to 1m high, which provide release height. Most seed, however, lands within 4m of the parent plant. Studies in the Netherlands of the seed dispersal of *Succisa pratensis* as a sample species of nutrient-poor semi-natural grasslands illustrated the problems of connectivity where habitats have become highly fragmented, and decreased population sizes coupled with higher nutrient input will both reinforce decreased colonisation capacity.[829] The probability of colonisation of new or restored sites is therefore very low, unless adjacent to existing occupied sites or seed dispersal is artificially assisted.[830]

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[828] Adams, A.W. (1955). Succisa pratensis Moench (Biological Flora of the British Isles). *Journal of Ecology* **43**: 709-718.

[829] Soons, M.B. & Heil, G.W. (2005). Reduced colonisation capacity in fragmented populations of wind-dispersed grassland forbs. *Journal of Ecology* **90**: 1033-1043.

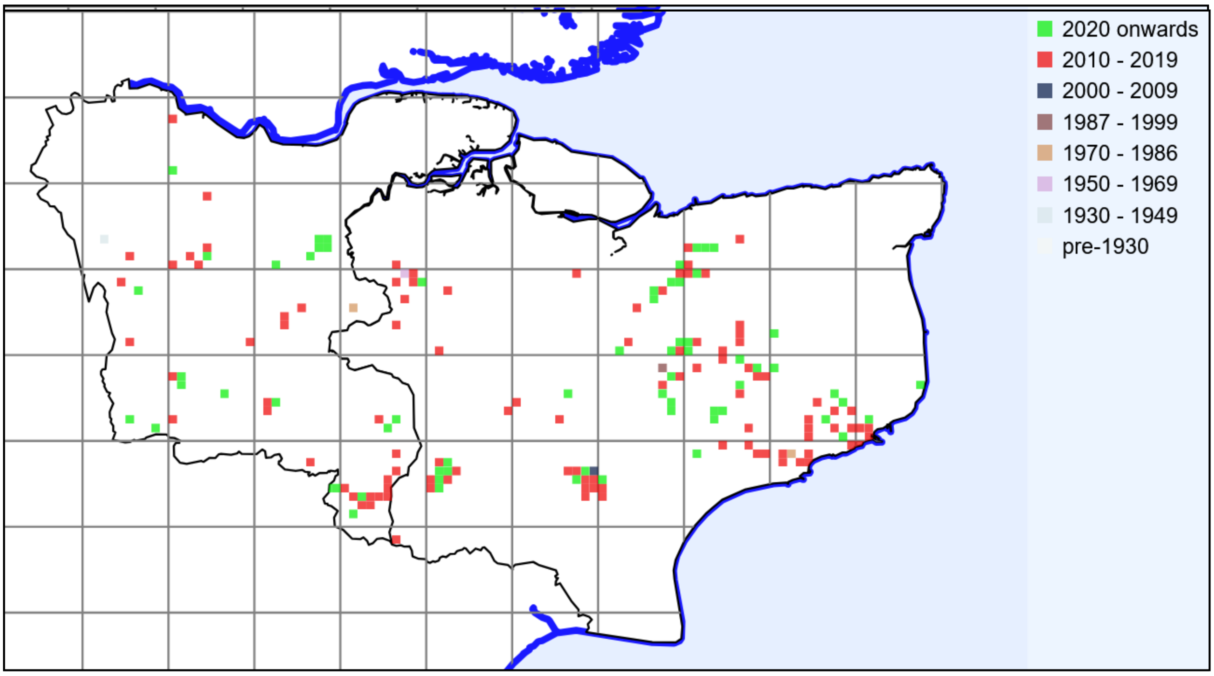
[830] Soons, M.B. *et al.* (2005). Habitat fragmentation reduces grassland connectivity for both short-distance and long-distance wind-dispersed forbs. *Journal of Ecology* **93**: 1214-1225.

We have very limited data on associated flora in Kent, although the species is listed as a Kent axiophyte, indicative of habitat which is important for conservation. Its axiophytic function, however, is not straightforward because of the variety of habitats it occupies, and the corresponding variation of associated flora; the Biological Flora of the British Isles account lists six very different associated groups of plants for six different habitats. We have noted it in chalk grassland, including in dense *Brachypodium rupestre* (Tor-grass) on cliff-tops at Dover. The chalk grassland of the castle slopes at Castle Hill, Folkestone may offer an example of the sort of site to which the Biological Flora of the British Isles refers as formerly disturbed (such as the mounds at Avebury and other once occupied sites on the chalk, where it is absent from adjacent grassland). By contrast, we have also noted it in *Salix*/*Rhododendron* swamp (mostly densely shaded) at Bedgebury; in sphagnum bog under birch coppice and also on a trackside by chestnut coppice, both at Angley Wood; along an acid shaded roadside near Kilndown with *Betonica officinalis* (Betony), *Solidago virgaurea* (Goldenrod and *Serratula tinctoria* (Saw-wort); in churchyards at Dunkirk and Northumberland Heath; in damp pasture on Ashdown Formation at Gilridge; but most frequently along woodland rides.

Winterbourne. Photo by Lliam Rooney, 22 September 2017

Rare plant register data for this species is being maintained at monad resolution, as given in the distribution map below. These records are almost entirely from 2000 onwards, primarily 2010-23. Previous recording was, at least from the 1970s, at tetrad level, and this is why the earlier distribution map was given in tetrads, so as to be able to compare trends over time.

***Succisa pratensis* Kent records to 2024 mapped at monad level, from BSBI database.**



Succisa pratensis is recorded as having five varieties in the British Isles, most of which have a restricted distribution not known to include Kent, and our plants are assumed to be var. *pratensis*. However, var.

grandifolia, a tall plant with many flower heads with distinctly toothed stem leaves, is known from a peaty woodland swamp in Sussex, and var. *ovali*s, flowering from May to July, has been grown as wildflower seed and so could be introduced. *Succisa pratensis* is only likely to be confused with *Knautia arvensis* (Field Scabious) or *Scabiosa columbaria* (Small Scabious). Its purple-blue flowers are normally distinctive, but it does possess a colour range; its leaves have narrow cartilaginous margins turning reddish, are sometimes purple-blotched and their petiole is often purplish near the base – none of these characters apply to the other species, which also differ in having divided stem leaves.

Otford Hills. Photo by
David Steere, 29 August 2016

Kent Rare Plant Register
Species accounts Part T

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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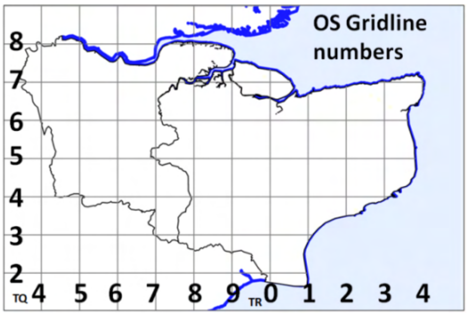
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

ACH A.C. Henderson
AJ Ade Jupp
AL Alex Lockton
AW Tony Witts
BB Brian Banks
BF Brian Ferry
CD Chris Dyson
CW Caroline Ware
DC Danny Chesterman
DM Daphne Mills
DP Donald Pigott
DP David Penney
EGP Eric Philp
FRG Bob Gomes
GC Gordon Corbet
GF Gwyneth Fookes
GK Geoffrey Kitchener
GS Geoffrey Smith
HS Holly Stanworth
HW Hector Wilks
JBe Jim Bevan
JC Juliet Cairns
JK J.D. Kesby
JL Judith Linsell
JM Joumana Mobarak
JOM J. Owen Mountford
JP Joyce Pitt
JR Julian Reed
JRP John Palmer
JS Judith Shorter
JW Jo Weightman
IW I. Warren
KBRG Kent Botanical Recording Group
KC K. Chandler
KFC Kent Field Club
KJKK K.J.K. Kirby
KR Kate Ryland
LM Lesley Mason
LR Lliam Rooney
MC Mick Crawley
MHD M Dolling
MJB Matthew Berry
ML Mel Lloyd
MP Marjorie Penney
MS Mark Spencer
MT Mario Tortelli
PH Peter Heathcote
PS Philip Sansum
RG Richard Gowing
RH Richard Herbert
RM Richard Moyse
RMB Rodney Burton
RPW Roy Wells
RS R.C. Stern
SB Sue Buckingham
SBS Surrey Botanical Society
SC Steve Coates
SL Stephen Lemon
SMC S.M. Curry
TGCR Tim Rich
TI Tim Inskipp

Other abbreviations and references:

BBS (SE) = British Bryological Society (South East Group)	CGE = Cambridge University herbarium	MOD = Ministry of Defence
BM = Natural History Museum herbarium	Hanbury & Marshall (1899) refers to their *Flora of Kent*	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp
BPS = British Pteridological Society	KWT = Kent Wildlife Trust	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	LNHS = London Natural History Society	SLBI = South London Botanical Institute herbarium

Teesdalia nudicaulis W.T. Aiton (Shepherd's Cress)

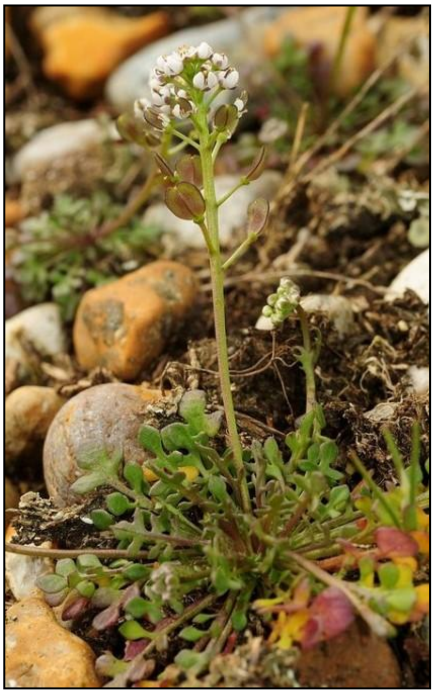
vc 15, gone from vc16 (if ever there)

Rarity / scarcity status

Teesdalia nudicaulis is an annual of open sand, gravel or shingle, scattered across Great Britain in both inland and coastal situations; rare in Ireland. In both England and Great Britain as a whole its conservation risk assessment is **Near Threatened**. A comparison of English data over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 24% reduction in the likelihood of recording the species. In Kent it is virtually restricted to the Dungeness area, where there appears to have has been little change in its frequency in recent years; it verges on being **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Account

Dungeness was not well botanised until relatively late, so that the first Kent record for the species was in 1867, by George Dowker[831] ('Beach, sparingly'). Dowker is also credited by Hanbury and Marshall (1899) with a record near Stourmouth; one wonders if this originated from material brought back from Dungeness (Dowker lived at Stourmouth House). Hanbury & Marshall (1899) expressed surprise at the plant's absence from the sandy heaths of West Kent. It is true that the species has inland occurrences of this nature in Great Britain; although Marshall was probably influenced in this view by the frequency of the species in west Surrey (he was curate at Witley and Vicar of Milford during the writing of the *Flora of Kent*). Hanbury & Marshall (1899) also give a record from near Cranbrook (this may be doubtful) and another under the cliffs at Kingsdown. Not noted by them is J.B. Saul's collection of a specimen (in **BM**) in 1875 from New Brompton, which suggests an association with military or dockyard activities.



Dungeness. Photo by Lliam Rooney, 14 April 2011

Philp (1982) noted it as native on sandy ridges among the shingle beaches at Dungeness and Hythe, frequent in these areas and found in 15 tetrads. Philp (2010) had fairly similar (but not identical) coverage, but did not re-find the species in its former two tetrads at Hythe (this may have been due to limitations of access on the MOD firing range). Its continued presence at Hythe ranges, however, was affirmed by a 2013 visit in which it was recorded as well represented on established shingle heath with *Cladonia* lichens, *Rumex acetosella* (Sheep's Sorrel), *Sedum anglicum* (English Stonecrop) and *Jasione montana* (Sheep's-bit) at TR 14989 33868, TR 1493 3374 and TR1405 3315. The habitat was vulnerable from vehicle disturbance.

Our 2010-24 records amount to 14 tetrads (26 monads), and there is no material change in distribution, except for one anomalous record at Wittersham, where it has been present for over 35 years as a result of laying out a garage drive with ballast imported from Lydd. Maps are given below on monad and tetrad bases, their presentation differing because pre-2010 recording was generally on a tetrad basis and subsequently changed to monad (1 x 1km square) recording, which provides greater precision. The more recent records show a gap between east and west Dungeness records which is not reflected in the older tetrad data, although this may be a function of access limitations on the Lydd Ranges.

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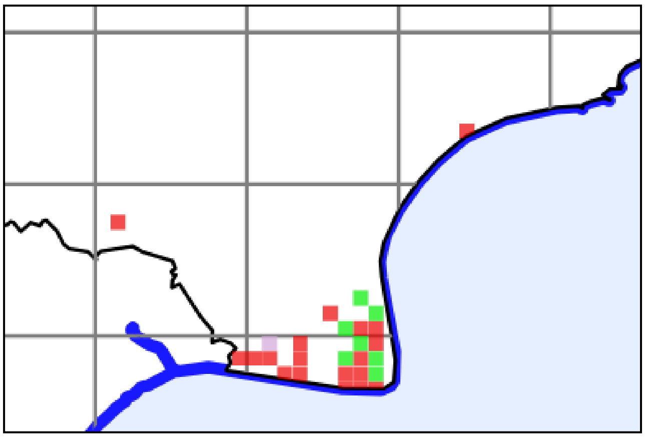
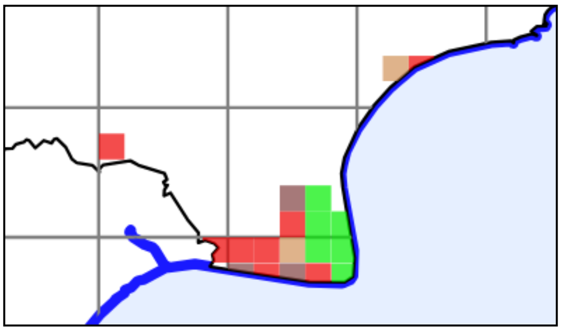
[831] *Report of the East Kent Natural History Society* (Session 1867), pp.28-34, account of an indoor meeting reprinted from the Kentish Gazette of 23 July 1867. Dowker presented a list of flora, including *Teesdalia*, observed on an excursion from Appledore to Lydd and Dungeness Point. The Society itself made an excursion to Dungeness Lighthouse on 29 July 1867, on the steamer 'Palmerston' departing from Admiralty Pier, Dover at 11 a.m., arriving at Dungeness at 2p.m. and disembarking, with considerable difficulty because of the nature of the beach, by small boats. No further list of the flora was then made, and because of bad weather, the floral specimens gathered were generally not of the best.



***Teesdalia nudicaulis* Kent records to 2024 mapped at monad level, from BSBI database.**



***Teesdalia nudicaulis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

It is often found in great quantity, and sites may hold thousands of plants. Our recent records mention presence on stabilised shingle, generally lightly vegetated on the ridges or fulls which represent the remains of former shorelines abandoned by the eastward accretion of shingle on the developing promontory. These ridges acquire a blackish soil from lichen encrusting the pebbles and from wind-blown material, and develop a flora succession which, at least at Denge Beach, appears to lead from the pioneer stages of *Atriplex* and *Crambe* strandline to *Arrhenatherum* grassland, thence to *Cytisus* scrub and to calcifuge grassland.[832] A slightly mesotrophic form of the latter habitat is characterized by *Aira praecox* (Early Hair-grass), *Festuca filiformis* (Fine-leaved Sheep's-fescue), *Rumex acetosella* (Sheep's Sorrel) and some or all of *Teesdalia nudicaulis*, *Cerastium fontanum* (Common Mouse-ear), *Plantago lanceolata* (Ribwort Plantain), *Poa compressa* (Flattened Meadow-grass), *Sedum anglicum* (English Stonecrop)and *Jacobaea vulgaris* (Common Ragwort). Other species accompanying *Teesdalia* are *Teucrium scorodonia* (Wood Sage), *Anthoxanthum odoratum* (Sweet Vernal-grass) and *Silene nutans* (Nottingham Catchfly). The habitat is base-poor and summer-parched, very well-drained because of the shingle substrate and the strong winds which contribute to generating a soil-water deficit.

Dungeness, habitat. Photo by David Steere, 10 April 2021

A variant habitat has been noted along the margins of the shingle beaches and natural wetlands, where shingle dips below deposits of alluvial soils, in which the floral balance varies somewhat from that of the usual calcifuge grassland, with particular prominence afforded to *Teesdalia*, in conjunction with *Sedum anglicum* and *Silene uniflora* (Sea Campion). These observations are specific to Dungeness; a wider range of habitats exists elsewhere in the British Isles, although always in open areas on sandy/gravelly terrain.

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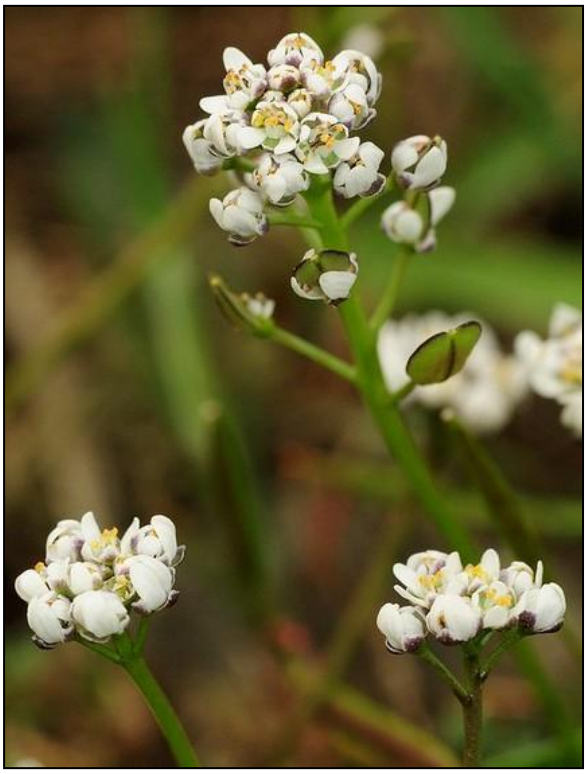
[832] For this and subsequent vegetation analysis, vide Ferry, B., Lodge, N. & Waters, S.(1990). Dungeness: a vegetation survey of a shingle beach. N.C.C. research & survey in nature conservation, report 26.



Dungeness. Photo by Lliam Rooney, 14 April 2011

Teesdalia nudicaulis is an annual, with potential for considerable fluctuation in populations. It is normally in flower April-June, but seed requires some after-ripening and little germination takes place before August. A period of continuous moisture is required and although early germination from then onwards may be expected to give rise to larger plants and greater seed production next year, the earlier the germination, the greater the risk that the seedlings will be killed by an autumn drought.[833] In the absence of moisture, germination may be prolonged; in East Anglia, the exceptionally dry autumn of 1959 was observed to delay germination by about 6 weeks later than the previous year. Most germination occurs in the year that the seed is produced. It is generally considered that the species has a very short-lived seed bank, but there is some evidence that it is more persistent than assumed.[834] There are no special mechanisms for seed dispersal.

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[833] Newman, E.I. (1963). Factors controlling the germination date of winter annuals. *Journal of Ecology* **51**: 625-638.

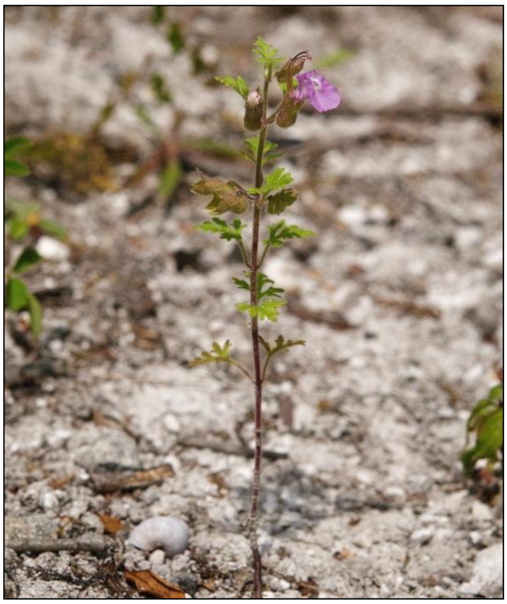
[834] Cited in Stroh, P.A. 2015. *Teesdalia nudicaulis* L.. Shepherd's Cress. Species Account. Botanical Society of Britain and Ireland.

Teucrium botrys L. (Cut-leaved Germander)

vc 16, gone from vc15

Rarity / scarcity status

Teucrium botrys was given in the British Red Data list (editions 1 to 3) as a national rarity, limited to six sites in Britain[835]. In the 2005 list[836], however, it was placed in a 'Parking List', together with other taxa where evidence suggests that they are neophytes or recent introductions (whereas the Red Data List is focused on natives and archaeophytes, or ancient introductions). The reasons for appearing in the Parking List are that this is regarded as an invasive weedy species in cultivation; and that, although it has been cultivated from 1633, it was not recorded in the wild until 1844 (this was a find in Surrey, 'far from any house or garden'). These reasons are discussed further towards the end of this account. The species is described in Stace (2010)[837] as 'possibly native', and the residual uncertainty as regards the decision to treat the species as a neophyte has led to its retention on this rare plant register, which does not normally cover introduced species. The species continues to be prohibited from picking or sale under the Wildlife and Countryside Act 1981 as amended (a protection afforded when its status was more highly regarded). In Kent it is restricted to one site of long standing, and is **rare.**



Halling, the sole plant found in 2017. Photo by Alfred Gay, 18 July 2017

Account

The first record of the species in Kent was by A.H. Wolley Dod in 1894: 'A small but dense patch on the slopes over Upper Halling, but growing in rough ground; one might easily pass within a few yards of it, as I must have done two or three times, without noticing it. This is by far the most interesting addition to the county flora I have yet made. I have little doubt it is native.' (*Journal of Botany* (1895) **33**: 85-86). Hanbury & Marshall (1899) also treated it as native: 'There appears to be no probability of its introduction here, the station being on an uncultivated down. It should be found elsewhere in this part of Kent'. It was indeed found elsewhere in Kent, on the downs above Eggarton Manor, Godmersham, from which there is a herbarium specimen from W.H. Hammond (1903) in **BM** and various later records, including by John Jacob (specimen in **SLBI**): 'Rather abundant in a field between Winchcombe Farm, Crundale, and Godmersham. It was such an out-of-way place that it is quite probable that no-one with any knowledge of botany had crossed it for years. It had not been ploughed for some months. I should imagine that the last crop was tares. It might have been introduced with the seed.' The Godmersham site was seen by Francis Rose, who noted the plant as on bare open chalk down, an ex-arable field, above Eggarton Manor, and the last sighting appears to have been in 1951.

The Halling site became the classic Kent location and from its first discovery on open downland in 1894 it has since become restricted to the floor of a disused chalk pit, White Pit. These are not quite the same place, as White Pit existed in 1894 with approximately its current dimensions, as may be seen from the 1896 ordnance survey (the beginnings of the pit are shown in the 1869-73 map series), so the downland will have been outside. However, a number of later records place the species on ground outside, but in the vicinity of the pit. Lousley knew it (1944) 'in very small quantity on broken ground near chalk pit'; Francis Rose (1943) as in 'broken chalk turf at brim of pit' and then (1944) 'Loose chalky ground at edge of big chalk pit'; Rosemary FitzGerald (1985) as 'At least 250 flowering plants including two white-flowered ones. Abundant seedlings. Growing in open patches among scrub on a steep, south-east facing slope at the edge of the chalk pit.' and (1986) 'More than 500 plants at the edge of a chalk pit' (TQ 629 651, a location directed to her by Joyce Pitt). Records from within the pit probably begin with A.J. Wilmott (1950) 'on chalk pit rubble', Francis Rose (1952) 'bare chalk scree', and are more clearly represented by B. Davis's record (1974) of 'A small colony of plants, not in flower, which I took to be *Teucrium botrys*, in a more than usually bare chalk area near the centre of the pit'. It appears that plants grew both within and outside the pit in 1993, when sampled for the purposes of seed collection by J. Terry and T. Parsons for Kew, as they found c.200 plants on the floor of the disused quarry and 999(!) on the top rim. The upper site is associated with an electricity pylon stationed above the pit (whose cables traverse the pit to link with another pylon at the south eastern end), as in 1994 Ben Cook recorded 169 plants in a 12 metre square area associated with the power line at TQ 692 651, as well as some hundreds more at TQ 693 651, which are likely to have been within the pit. The land beneath the pylon on the hillside above the pit is (2018) dense scrub, and woodland or scrub extends to the whole rim of the pit, so that there no longer appears to be scope for *Teucrium botrys* to grow on or in the vicinity of the margins.

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[835] Winship, H.R. (1999) *Teucrium botrys* L. (Lamiaceae), in Wiggington, M.J. (ed.) *British Red Data Books 1 Vascular Plants* (third edition), JNCC.

[836] Cheffings, C.M. & Farrell (eds.) (2005) *The Vascular Plant Red Data List for Great Britain*, JNCC.

[837] Stace, C. (2010). *New Flora of the British Isles* (third edition), Cambridge University Press, Cambridge.

Halling, habitat. Photo by Geoffrey Kitchener, 23 July 2018

The pit floor is accordingly the only current Kent location for the species, whose occurrence is affected by the increased growth of scrub and the absence of disturbance which might encourage germination from the seed bank. A search in 2016 failed to find any plants and another in 2017 found only one. Two visits were paid in 2018. The first, in May, located 15 young plants around a small area where there had been a bonfire. This area was re-located in the course of a Natural England condition assessment in July, when 26 plants ranging from multi-stemmed, 28cm high, to single-flowered, 3.5cm high, were counted. The disturbance created by the bonfire looks as though it was the cause of the species' reappearance. A further, very small, plant was also found in the July visit nearer where the 2017 plant had grown. Since then, pit access has apparently been affected considerably by scrub growth.

Teucrium botrys is in Britain considered to be a monocarpic biennial, or sometimes an annual; but in any event it is reliant upon spreading by seed and the availability of open habitat where it may germinate, either in spring or autumn. The considerable variation in size of the 2018 Halling cohort might suggest different germination times, particularly as the influence of neighbouring plants on growth would have been minimal, the *Teucrium* generally growing as separated plants on bare chalk.

Setting aside that the principal association of *Teucrium botrys* appears to be with bare ground, associated species for the 2018 plants comprised young shrubs/trees indicative of the habitat becoming scrubbed over, together with herbs/grasses capable of growing in dry calcareous conditions on minimal or no soil. The shrubs/trees included *Betula pendula* (Silver Birch), *Cornus sanguinea* (Dogwood), *Ligustrum vulgare* (Wild Privet) and *Rosa* sp. (Rose); all these, plus *Corylus avellana* (Hazel) and *Viburnum lantana* (Wayfaring-tree), were also associated with the 2017 plant. The associated herbs/grasses for the 2018 plants included *Lysimachia* (*Anagallis*) *arvensis* (Scarlet Pimpernel), *Campanula glomerata* (Clustered Bellflower), *Euphrasia nemorosa* (Eyebright), *Festuca ovina* (Sheep's-fescue), *Hypericum perforatum* (Perforate St John's-wort), *Leontodon hispidus* (Rough Hawkbit), *Lotus corniculatus* (Common Bird's-foot-trefoil), *Pilosella officinarum* (Mouse-ear-hawkweed), *Poterium sanguisorba* subsp. *sanguisorba* (Salad Burnet) and *Thymus polytrichus* (Wild Thyme).

Halling. Photo by Danny Chesterman, 14 July 2018

The issue as regards the species' status in Kent (and Britain) following placement on the Red Data Book Parking List is unlikely to be conclusively resolved, although in effect this withholds continued recognition of native status. Those who first saw it at Halling in the nineteenth century, before it became associated with the artificial habitat of White Pit, found its native status persuasive[838]. Although primarily a species of southern and central Europe, Asia and north Africa, it extends into northern France and Belgium, so that any native occurrence in Britain would not be seriously out of kilter with Continental distribution; and warm south-facing chalk slopes would be appropriate habitat for a species at the fringe of its range. It is certainly the case that *Teucrium botrys* is absent from the French side of the Straits of Dover, but it shares this characteristic with a number of other species which are present in warmer habitats in south east England and which also occur on calcareous escarpments of the Somme valley near Amiens. Francis Rose considered that the valley may well have acted as a major channel for migration of open-habitat calcicole species to Britain before the inundation of the Channel, and was more suitable for this than regions to its north and north west.[839]

A factor considered to be against native status is the length of time between its first record of cultivation (1633, in Thomas Johnson's edition of Gerard's *Herball*) and the first record of being found in the wild (1844 in Surrey, 1894 in Kent), on the basis presumably that the longer the period of cultivation, the more opportunities there are for escape. This does not seem especially relevant for *Teucrium botrys*, as there is little evidence for its cultivation after 1633; it is not a garden plant; nor is it particularly, despite its appearance in the 1633 *Herball*, a herbalists' plant. The relatively late date of the first finding is, however, a legitimate consideration, although not in itself conclusive evidence of non-native status without supporting data as regards means of introduction.

The other factor considered to be against native status is that it is considered to be an invasive weedy species in cultivation (if it is cultivated). Various case studies of weedy species denied native status are set out in

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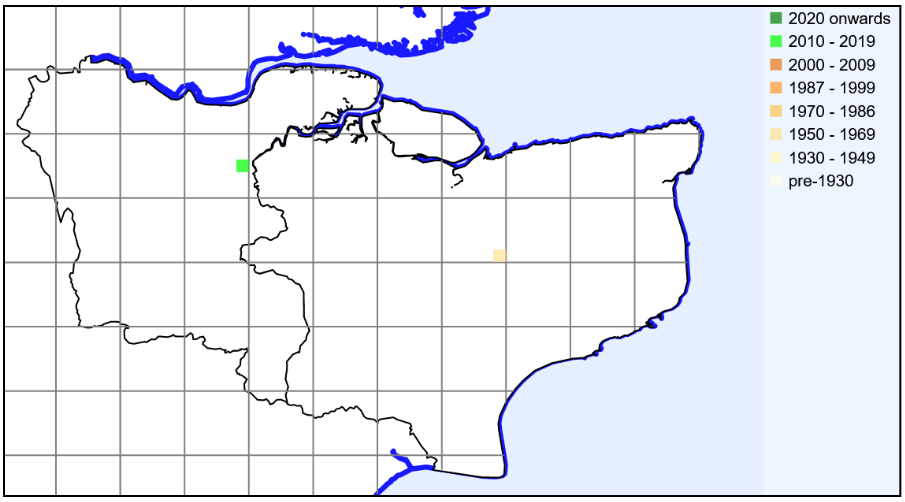
[838] As did William Bennett in relation to the original Surrey discovery, vide *The Phytologist* **3**: 737-738.

[839] Rose, R. (1962). Floristic Connections between Southeast England and North France. In Valentine, D.H. (ed.) *Taxonomy, Phytogeography and Evolution*. Academic Press, London.

Pearman (2007)[840], but it is difficult to see how their features may be applied to the present case. If the implication is that it has proved invasive in escaping from cultivation, this does not accord with the general absence of evidence of its cultivation. It is not a species which has common features with those in the case studies which occupy artificial habitats such as car parks or railways, noting that in Kent it seems to have moved **from** open downland **to** a chalk pit, not the other way round. However, the Parking List decision has been made and hence the species is no longer afforded a threat or rarity status for conservation purposes. Nevertheless, Pearman (2007) recommends the extension of 'the parameters of species worthy of protection to those species which are an integral part of the mosaic which is being valued and conserved', including *Teucrium botrys* 'as species very persistent in open, species-rich, therophyte communities'. The inclusion of *Teucrium botrys* in the rare plant register is consistent with this recommendation.



***Teucrium botrys* Kent records to 2024 mapped at tetrad level, from BSBI database.**

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[840] Pearman, D.A. (2007). 'Far from any house' – assessing the status of doubtfully native species in the flora of the British Isles. *Watsonia* **26**: 271-290.

Thalictrum flavum L. (Common Meadow-rue)

vc 15 & 16

Rarity / scarcity status

Common Meadow-rue is widespread in wet habitats in the British Isles and its conservation risk status is one of of 'Least Concern', although it has shown decline since the 1930s. In Kent, it has never been common and currently is very **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Wye. Photo by Lliam Rooney, 9 July 2015

Account

The first Kent record is by John Gerard in his *Herball* (1597) and, coupled with others, is also the first British record: 'they growe upon the Thames banke, leading from Blacke Wall to Woolwich, neere London'. Presumably this related to the then undeveloped land between Woolwich and Blackwall Point, including the Thanriver frontage of Greenwich marshes. The record is continued by material collected between Greenwich and Woolwich in the herbarium of Dillenius (1684-1747). This distribution also continued further east alongside the Thames and its tributaries, Thomas Johnson's fellow-botanists having recorded it at some point between Erith and Gravesend according to Johnson's *Iter Plantarum*, 1629 (Frances Rose in the 1972 edition of that work referred to it as still growing between Erith and Dartford, probably its Barnes Cray site where he saw it in 1944 and which would have been a little downstream of the seventeenth century crossing-point of the River Cray).

It was also in the Darenth Valley, noted by Hanbury & Marshall (1899) as in meadows above Darenth, which may be the same as a record near the Farningham Road railway viaduct given in *Phytologist* (1861) **5**: 372 (in an anonymous article, apparently by J.S. Mill, which somewhat misleadingly refers to the viaduct crossing the valley which lies between the Crays and Farningham).

Wye. Photo by Lliam Rooney, 9 July 2015

Other nineteenth century records include the Medway: reed-beds near Burham and the left bank above Snodland, as well as several localities near Maidstone, including the Medway bank upstream towards East Farleigh. The Stour catchment also afforded records: J.S. Mill collected it from Chartham; G.E. Smith noted it in the early 1830s by the bridge at Ashford; and in the marshy ground around Sarre and Minster it was recorded before 1847 (presumably on the north side of the Stour catchment, whereas Thomas Johnson's 1632 sighting west of Sandwich, en route to Canterbury, would have been on the south side).

Hanbury and Marshall's assessment was of a rather rare native of stream-sides and marshes. There are a couple of records cited by them which might give rise to query: Mrs Petley's sighting at Sutton Valence seems improbable; and Thomas Forster's claim in *Flora Tonbrigensis* (1816) that it was 'In marshy ground, not uncommon' in the area which he covered, the neighbourhood of Tunbridge Wells (extending well into Sussex as well as north to the Medway to Tonbridge) remains unsupported by other finds, although Edward Jenner included it from the mill pond at Snodland in his *Flora of Tunbridge Wells* (1845) by dint of covering places within 15 miles of the town.

Wye. Photo by Lliam Rooney, 9 July 2015

Philp (1982) regarded the species as very rare at the edge of rivers and in marshes, with only two localities along the Medway and one along the Great Stour, near Chilham. Losses from older sites were attributed in Philp (2010) to land drainage, agricultural intensification and building developments, so that the Medway presence was of only a few plants on both east and west banks, although a good quantity remained in a small marsh by the Great Stour at Wye. These assessments omitted any records outside the administrative county and so did not include the long-persistent colony at Ruxley gravel pits in the London Borough of Bromley; nor did the possible site of a 2010 find at Flimwell, as this fell within the administrative county of East Sussex.

Post-2000 occurrences of this species in Kent are limited to Ruxley, Wye and the Stodmarsh area (plus a questionable record for Flimwell, TQ73F). There has not been a confirmed re-finding of plants alongside the Medway near Snodland and Burham, in spite of the length of its occurrence there, and it ought still to be present by the extensive reedbeds. Records back to the 1970s are set out in the table below; and distribution is shown in the accompanying map, where records have been made to tetrad level or finer resolution. We have found it in wet ground, where its height (up to 1.2m) enables it to compete with tall vegetation, so that it can survive at least at the edge of *Phragmites australis* (Common Reed) stands. Our recent habitat descriptions include marshy riverside tall grassland with associated species of similar ecological requirements, *Valeriana officinalis* (Common Valerian) *Filipendula ulm*aria (Meadowsweet) and *P. australis*; an ungrazed arable field margin adjoining a ditch in a river floodplain; and grazing marshes by a ditch and pool. It is unclear how far *Thalictrum* species are wind-pollinated, insect-pollinated or apomictic. Given the habitat of *T. flavum*, it is likely that seeds are distributed by flood-waters; German studies[841] of wet-meadow species indicate that germination of *T. flavum* only takes place after dormancy is broken by stratification and fluctuating temperatures, with a peak in June (so avoiding germination during winter flooding and low temperatures) but otherwise spread out; high temperature requirements and delayed, asynchronous germination being a characteristic shared by perennials with a preference for the damp parts of flood meadows. So far as our Kent observations go, this is not a particularly successful species in spreading, although at Ruxley it has expanded as a patch over the course of 50 years.

The achenes range in shape from subglobose-ovoid to oblong-ovoid and this character affords varietal status (var. *flavum* and var. *morisonii*, with the mid-point of the range, ellipsoid-ovoid, being called var. *riparium*; this last being the possible identity of a Medway specimen collected by William Beeby in 1878). The table below includes one record for north west Kent (there are others not set out here) which was given as *Thalictrum*

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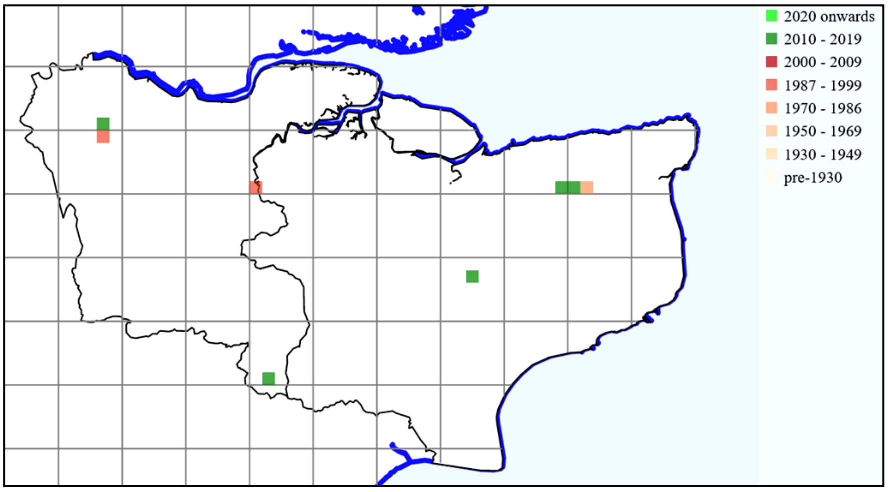
[841] (1) Hölzel, N. & Otte, A. (2004). Ecological significance of seed germination characteristics in flood-meadow species. *Flora* **199**:12-24. (2) Patzelt, A. , Wild, U. & Pfadenhauer, J. (2001). Restoration of Wet Fen Meadows by Topsoil Removal: Vegetation Development and Germination Biology of Fen Species. *Restoration Ecology* **9**: 127-136.

flavum subsp. *glaucum*, a synonym for *Thalictrum speciosissumum* (Tall Meadow-rue). This is an introduced plant, distinguishable from our native species by its glaucous leaves, with prominent veins on the lower side.

Thalictrum flavum **Kent records to 2024 mapped at tetrad level, from BSBI database. N.B. the NW Kent record is overstated as two tetrads; this represents one colony close to a tetrad boundary. The S. Kent record is questionable.**



Site	Grid reference	Site status	Last record date	Recorder	Comments
Ruxley pits (metropolitan vc16)	TQ4769	SSSI owned by Environment Agency, LNR managed by KWT	(1) 2019 (2) 28 September 2006 (3) 1988 (4) 1987 (5) 1980 (6) 30 September 1978	(1) RH (2) JP (3) JP (4) GC (5) JP (6) OFC	(1) Ruxley Gravel Pits Nature Reserve, a patch about 10ft across, i.e. far more plentiful than when known by RMB more than 50 years before (at TQ 474 698). There is apparently a fence round it, reinstated Sept 2019. Grid reference was given as TQ4770, but various sources indicate that it is TQ4679, close to boundary. (2) TQ4769 (3) TQ4769 (4) Still thriving though not increasing. (5) c. 20 plants. (6) TQ 473 699. [First recorded here in 1963.]
[Stone	TQ5574		27 May 1989	JRP]	[Subsp. *glaucum* on old hospital site, Bow Arrow Lane.] Not the native plant; better considered as *T. speciosissimum*.]
[Flimwell]	[TQ73F]		[25 August 2010]	[MB, JL & RPW]	[This record appears on the BSBI database as part of a general survey of the relevant tetrad, but it is possible that there has been an error of input. One of the recorders has no recollection of it and points out that the recording card used would have required a specific note of such a find with supporting details; there are no such comments associated with the record. The tetrad contains some wet ground, but no classic river valley habitat such as applies to other Kent records.]
Snodland	TQ76A	SSSI, in part	(1) 1991-99 (2)1987 (3) 11 July 1987	(1) EGP (2) EGP & JBe (3) GK	(1) A few plants on east and west banks of the Medway, TQ76A. (2) TQ76A.

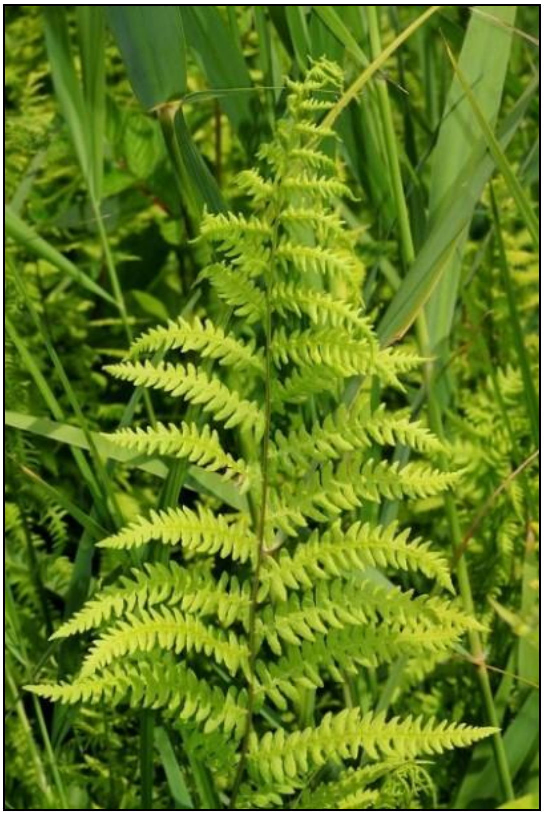
			(3) Before 1981, after 1970	(4) Philp (1970)	(3) TQ 713 612 - TQ 714 613, a few plants at bottom of raised bank by Medway, edge of *Phragmite*s stand. [Not found, 2021, GK: the bank has increasingly scrubbed over and has become difficult to access.] (4) Two localities along the Medway, TQ76A. [An unattributed1970 record gives a location of TQ 705 604 and an unconfirmed 1993 record gives TQ 700 603. These are part of the Leybourne Lakes complex rather than the river.]
Wye	TR04N		(1) 19 July 2015 (2) 4 July 2011 (3) 2 August 2004 (4) 1991-99	(1) LR, DM & JS (2) LR (3) JW (4) EGP	(1) Site as below. (2) TR 04871 46473, near Sewage Works in a marshy area near the Stour. Up to 50 plants in a localised area c. 2.5m x 1.5m. Associates: *Valeriana officinalis*, *Filipendula ulmaria*, *Urtica dioica* and *Phragmites aus*tralis. (3) TR 048 465. (4) TR04N, in good quantity in a small marsh.
South Westbere, Stodmarsh	TR1960	SSSI	2 May 2016	TGCR & AL	TR 1987 6022, Higham Farm, about a dozen plants by a ditch in grazing marshes, around a pool next to a farm track where cattle drink.
Stodmarsh	TR2161	SSSI, National Nature Reserve	(1) 27 June 2022 (2) 15 May 2022 (3) 16 May 2016	(1) AL (2) AL & JM (3) AL & JM	(1) TR 2185 6115, ditch survey. (2) TR 2185 6114. A good-sized stand in reedswamp. (3) TR 2184 6114, Stodmarsh Court Farm, many plants over about 20m of wet grassland in a cut and ungrazed arable field margin, against the boundary ditch to the reserve.

Thelypteris palustris Schott (Marsh Fern)

vc 15 & 16

Rarity / scarcity status

Thelypteris palustris has a scattered distribution in marshes and fens across the British Isles, but is only frequent in East Anglia. Its conservation risk status in England and Great Britain as a whole is one of 'Least Concern', based on its performance in the period 1930-99 (although it would be regarded as Threatened if pre-1930 data had also been taken into account). It is a **nationally scarce** species and is also **scarce i**n Kent, where there have only ever been a few scattered sites. It is a Kent axiophyte and so is indicative of good habitat.



Ham Fen. Photo by Lliam Rooney, 13 July 2013

Account

The first record of Marsh Fern in Kent is attributed by Hanbury & Marshall (1899) to W.W. Saunders, as found about Ham Brooks, published by Matthew Cowell in his *Floral Guide for East Kent, etc*. (1839). This appears to be a misreading, in that the finder is given by Cowell as William Pamplin junior. This is a site which, as Ham Fen KWT reserve, still bears Marsh Fern in quantity.

Another is Dungeness, where George Dowker in 1867[842] described a visit in which Marsh Fern was seen 'Abundant in one pond on Beach' ('this beach is accumulated in certain fulls or ridges which correspond with periodical high tides, and as these ridges remain, the beach shows a continuous succession of these, marking the successive changes which have taken place in the shore…between Lydd and the sea, certain breaks occur in the regularity of this beach, which now constitute large fresh water ponds of some acres in extent'). This is an early notice of the Open Pits, where the fern still flourishes. Hanbury & Marshall (1899) also mentioned, among other locations, bogs at Tucker's Mill Pond, Cranbrook, where it had been found by a local resident, A.W. Hudson. The fern was still present in 2017, although the pond no longer exists in its previous form and the habitat has become progressively less open.

Hanbury and Marshall's assessment was that this was a native fern of peaty swamps and copses; rare and local. Francis Rose in his manuscript *Flora of Kent* regarded the species as a native of fen and fen carr, very rare and local, but still plentiful in Ham Fen, where he knew it 1946-62; also at Dungeness, where he had seen it in three separate pits 1945-62; and Tucker's Pond, where it was abundant, 1945-61. He regarded it as gone from North Cray Brooks (a 19th century site), which he had searched in 1955 and the peaty woodland still looked suitable; and from a fen N.W. of Wingham where he had found it in 1947 and Miss Long recorded it in 1963. In his 1999 typescript revision of the Flora he also mentioned an Edenbridge site which first features in Philp (1982). Philp (2010) also mentions a new site near Seal, completely unexpected and yielding the fern in good quantity. Otherwise, the species is described there as a plant of open or partly wooded fen or open carr, present in five tetrads (whereas Philp (1982) gave only four). Since 2010, we have recorded in five sites (one of which, near Headcorn, is new), taking Dungeness as a single site, although the fern is spread over three monads there.

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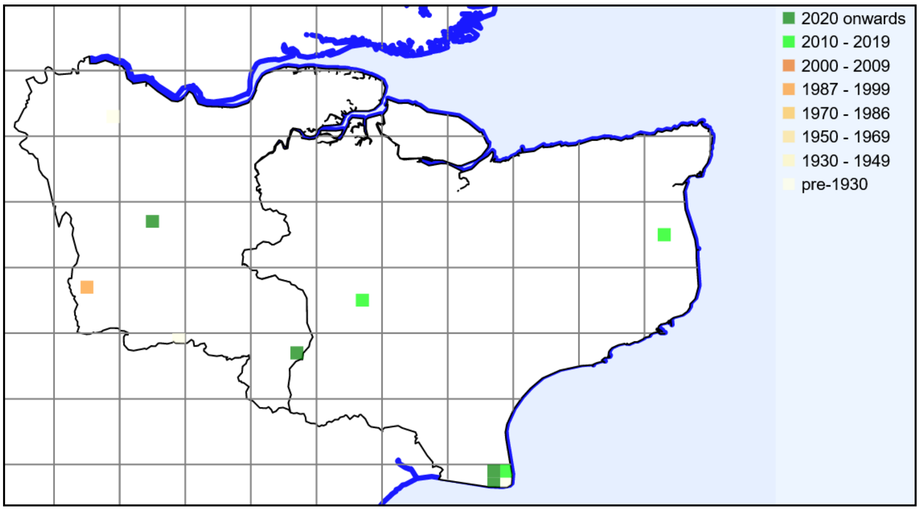
[842] Report of the East Kent Natural History Society, Session 1867, Seventh Meeting, pp.29-34.



Thelypteris palustris **Kent records to 2024 mapped at tetrad level, from BSBI database.**

So the overall picture is one of a fern which has had only a few sites in Kent, widely scattered, some of these long-persistent, but with occasional new ones arising. Whilst the habitat of the various sites shares characteristics of peaty marsh, there are differences which render it worthwhile considering each. It is not easy to see why the fern grows in these sites but not in other, apparently suitable ones.

The classic Kent site for the fern is **Ham Fen**, an area of valley-fen with alkaline drainage from chalk and covered with a layer of peat. This is a survival of a much more extensive boggy tract with open water ('Ham Ponds', which probably disappeared in the course of the 19th century). In 1950, Francis Rose described[843] the area as carrying a remaining tract of open primitive fen, but with succession to fen carr and damp woodland: 'in the open scrub, *Cladium*, *Lysimachia vulgaris*, *Thelypteris palustris* and *Carex paniculata* persist locally.. The two latter, indeed, are still to be found in quite dense carr, although under these conditions the fern produces no fertile fronds'. The fern is still (2013) present in large quantity in such open and successional areas.

Ham Fen. Photo by Lliam Rooney, 13 July 2013

The **Dungeness** open pits also provide fen conditions with alkaline drainage (presumably from shell content of the surrounding shingle), although there are some acidic peaty areas and transition between nutrient-rich and nutrient-poor habitat. The pits are remarkable as fresh water lakes of completely natural origin on shingle, where they appear to have formed between shingle ridges as a result of changes in direction of shingle accretion and developed from saline lagoons over a period of 700-1,000 years.

Dungeness. Photo by Geoffrey Kitchener, 15 June 2010

Thelypteris palustris occurs at many of the pits, some of which have lost their open water to closed fen communities. Francis Rose (1953)[844] regarded it as more frequent than anywhere else in south-east England, recording it as locally dominant in parts of four pits and, together with *Comarum palustre* (Marsh Cinquefoil) actually choking one. Around two of the lakes he noted a tall reed-swamp which landwards was supplanted by wet *Thelypteris* fen and further landwards a drier sedge community.

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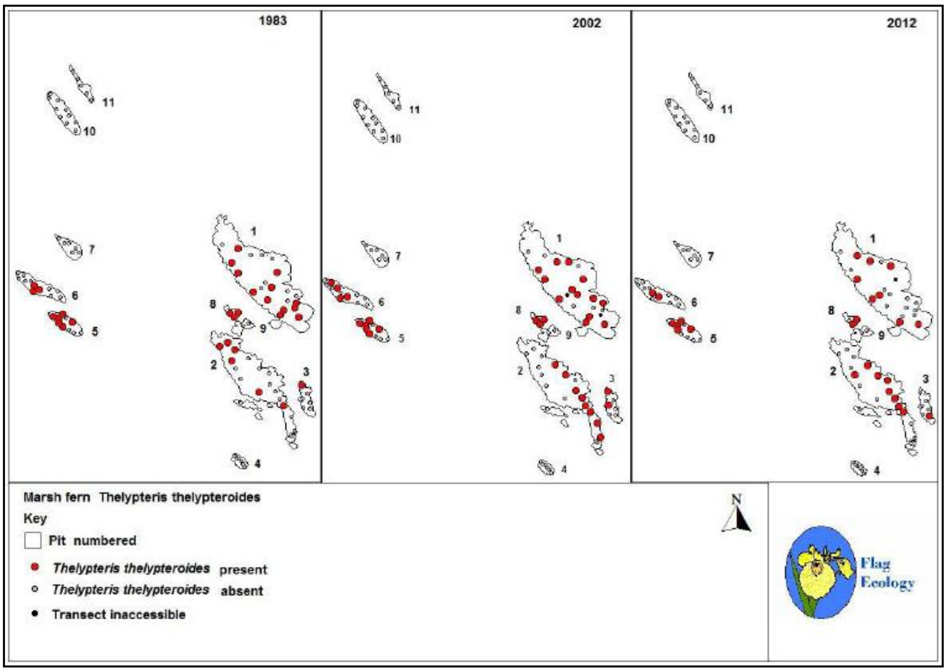
[843] Rose, F. (1950). The east Kent fens. *Journal of Ecology* **38**: 292-302.

There have been changes since then, especially with the lowering of the water-table since about 1970, and the open pits flora was surveyed in 2012 (Banks & Ferry, 2013[845], from which the accompanying map is taken) following transects which had been assessed in 1983 and 2002. Marsh Fern was recorded from transects in pits 1, 2, 3, 5, 6 and 8 in 2012, as it had been in 1983 and 2002. In some cases the recorded presence was substantial: 10m x 2m transects contained up to 40% cover by Marsh Fern in pits 1 and 2, up to 50% in pit 6. It was also found in pit 7 in 2002 and 2012, a vigorous stand, but this does not appear in the mapping as it was outside any transect.

Dungeness, habitat (reed swamp with vegetation raft including *Thelypteris*). Photo by Lliam Rooney, 22 June 2013

It is concerning, however, that a steep decline appears to have taken place from 36 transect records overall in 2002 to only 26 in 2012. This is especially in pits 1 and 3 from areas dominated by *Phragmites australis* (Common Reed) which, together with *Salix cinerea* (Grey Willow) appears to have been an agent of succession replacing some of the fen communities known in the 1950s, although Marsh Fern may be more resilient to *Salix* invasion, due to shade tolerance. There was also an apparent decline in pit 6 from four records (2002) to two (2012), although this may have resulted from the pit being more flooded in 2012 (as the transects are measured from the water's edge, flooding may have moved back the start point so that the transect no longer reached the peaty ridge in the centre of the pit where the fern grows).


1983
2002
2012
11
10
7
6
5
1
8
9
2
3
4
Marsh fern Thelypteris thelypteroides
Key
☐ Pit numbered
● *Thelypteris thelypteroides* present
○ *Thelypteris thelypteroides* absent
• Transect inaccessible
N
Flag Ecology

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[844] Rose, F. (September 1953). *Dungeness*. Unpublished report.

[845] Banks, B. & Ferry, B. (2013). *Fen vegetation monitoring Dungeness RSPB Reserve*. Unpublished report.

The colony at **Angley Wood, Cranbrook** occupies very different habitat, being High Weald woodland on Tunbridge Wells Sand Formation (hence including clays and siltstone) with a series of boggy flushes draining into two stream valleys which join together south of the former Spratsbourne Mill where they were dammed in the mid-seventeenth century to form Tucker's Pond. The pond has since drained, leaving a low-lying area with fen vegetation which has become less open with time, but where Francis Rose described Marsh Fern as being abundant, 1945-61, following a long history of occurrence. From October 1955, we have an account of its status from David Streeter, that the circumference of the fern patch was 65 yards, the pH of the water was 5.5 (i.e. moderately to strongly acidic) and the associated species were plants characteristic of damp or wet acid ground, both open and woodland, and included *Viola palustris*(Marsh Violet)[846]. By 2017, Stephen Lemon found the fern confined to an area of only 6m x 5m of damp (but not flooded) ground under the shade of tall alders, adjacent to an opening in the canopy. The decline may well be associated with the site becoming less open, even though Marsh Fern is shade-tolerant; expansion of *Scirpus sylvaticus* (Wood Club-rush), which is also shade-tolerant, will not have helped and it was noticeable that the fern was present in areas less dominated by that species.

Angley Wood, habitat. Photo by Stephen Lemon, 17 June 2017

A population east of **Headcorn**, discovered in 2019, again differs as regards aspects of habitat. This is in the Low Weald, on the Weald Clay Formation, the fern growing abundantly in nine patches around a large pond in a clay pit, bordered by a small amount of ancient woodland. The pond comprises a *Salix* swamp with a depth of peat which suggests that it is fairly old; but it (with three neighbouring smaller ponds from which the fern is absent) is not represented in this position on the 1868-71 ordnance survey or its revisions at least until 1909, so there is a possibility that is was excavated, enlarged or water-filled later on.

Headcorn, habitat. Photos by Stephen Lemon, 23 April 2019

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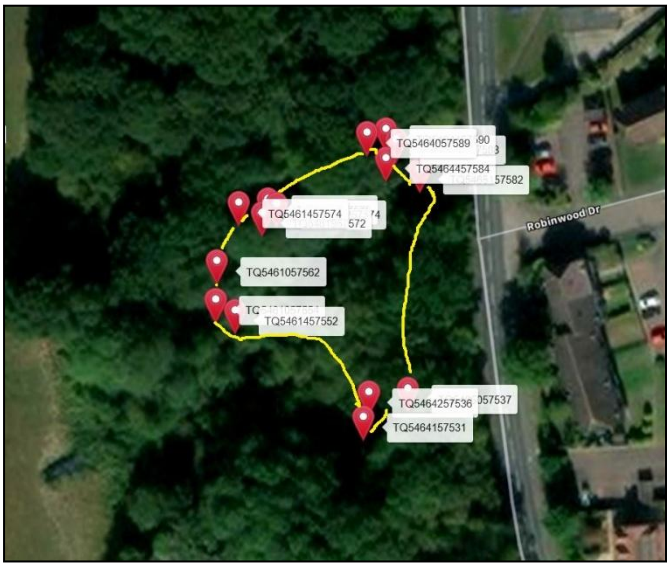
[846] The full list was: *Ajuga reptans* (Bugle), *Alnus glutinosa* (Alder), *Betula pubescens* (Downy Birch), *Carex laevigata* (Smooth-stalked Sedge), *Circaea lutetiana* (Enchanter's-nightshade), *Cirsium arvense* (Creeping Thistle), *Dryopteris carthusiana* (Narrow Buckler-Fern), *Eupatorium cannabinum* (Hemp-agrimony), *Galium palustre* (Marsh-bedstraw), *Juncus effusus* (Soft-rush), *Lonicera periclymenum* (Honeysuckle), *Lotus pedunculatus* (Greater Bird's-foot-trefoil), *Mentha aquatica* (Water Mint), *Mnium hornum* (Swan's-neck Thyme-moss), *Potentilla erecta* (Tormentil), *Potentilla reptans* (Creeping Cinquefoil), *Pulicaria dysenterica* (Common Fleabane), *Rubus fruticosus* agg. (Bramble), *Sphagnum* sp. (Bog-moss), *Succisa pratensis* (Devil's-bit Scabious), *Urtica dioica* (Common Nettle), *Viola palustris* (Marsh Violet).

At **Seal**, a site discovered in 2005, the habitat bears some similarity to that near Headcorn, in that it comprises a *Salix* swamp, but the geology is different. The location is on a north-facing slope leading down to the Guzzle Brook valley, and appears to lie at the junction of the sands of the Folkestone Formation with the underlying clays of the Gault Formation, so that drainage through the sands is impeded by the impervious clay and naturally surfaces at this point. Water is held back by raised ground to the south, resulting in wet, acid, swampy ground, overshaded by *Salix* spp. with many recumbent trunks and branches. An open pond is shown here in aerial photography from 1960 but is not obvious in 1940; none is shown on ordnance survey and it is probably not very old. The surrounding woodland, a strip alongside Childsbridge Lane, does not have ancient woodland characteristics, although a strip is present from early ordnance survey editions.

The fern was found to be abundant in 2011 and 2013, and to have increased further by August 2020 when there was no standing water, following a heatwave. Coverage was then estimated at 50m x (up to) 30m; it was not possible to take a full transect across the width, due to the depth of the swamp, but the approximate extent of the colony was mapped from a series of GPS readings from the margins.



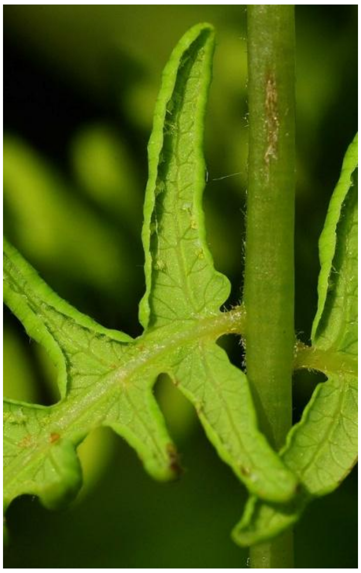
Seal. Colony extent in 2020: yellow line shows maximum extent, with GPS readings plotted.

The associated flora included species of wet acid habitats, such as *Carex paniculata* (Greater Tussock-sedge) and *Dryopteris carthusiana* (Narrow Buckler-Fern). These also accompany Marsh Fern elsewhere, the sedge being present at Ham Fen and Angley Wood. While the extent of Marsh Fern has increased in recent years, the longer-term prospects are not necessarily good. Sand quarrying has begun in the neighbourhood (the wider area of which is proposed for residential development) and while it is apparently not intended to affect the site directly, dewatering of the sand excavations has the potential to affect adversely the hydrology of the site.

Seal, habitat. Photo by Julian Reed, 26 August 2011

The five recent sites considered above are widely scattered across the county (see general distribution map above). Their geology is different; their degree of openness varies; the extent of association with ancient woodland or with open water varies; and the sites themselves often show a degree of transition or succession which may be beneficial or deleterious to Marsh Fern. The species sometimes appears as a colonist: the floating vegetation mats at the edge of the open pits at Dungeness are an example, and the extensive patches seen at Headcorn and Seal give an impression of spreading through the soft mud and decomposing leaf litter where competition is otherwise shaded out. The potential for rhizome extension is considerable; Page (1982)[847] refers to 30cm or so of growth per season, with occasional branching.

Marsh Fern is characterised by its rhizomatous habit, with single fronds arising along the rootstock, often strongly erect, especially in the open. The pinnule margins are tucked under.



Ham Fen, showing recurved pinnule margins. Photo by Lliam Rooney, 13 July 2013

Site	Grid reference	Site status	Last record date	Recorder	Comments
Edenbridge	TQ44N		(1) 1991-98 (2) After 1970, before 1981	(1) EGP (2) Philp (1982)	(1) & (2) TQ44N. Described by FR as by a pond E. of Edenbridge. This was also JP's recollection, viz. that it was at the far end of a fishing pond, where the ground was boggy/swampy [SL has surmised that this may have been the pond at TQ 455 474, the eastern half of which was tree-dominated in 1990 but by 2003 had been cleared and presumably the swampy ground had been excavated and added to the pond; the fern could not be found there in 2015]. EGP (pers. comm.) referred to the fern being in an unexpectedly open habitat, in a field, so this may well have been a different site. [There is a curious damp patch at TQ 44880 46742, but the fern could not be found here post-2010, GK.]
Seal	TQ5457		(1) 12 August 2020 (2) 26 October 2013 (3) 26 August 2011 (4) 30 September 2005	(1) GK (2) GK (BPS meeting) (3) JR (4) EGP & PH	(1) Still in great quantity, apparently increased since 2013, in *Salix*-covered swampy pool w of Childsbridge Lane, no standing water after heat-wave, but very wet. Covering area 50m x (?up to 30m, width difficult to ascertain as east side not so readily accessed due to depth of mud), generally continuously but less so at southern end. Sample grid-references taken for population margin, where accessible. Associated spp in addition to those in following entry included: *Carex pseudocyperus*, *Galium palustre*, *Juncus effusus*, *Lemna minuta*, *Lycopus europaeus*, *Ribes rubrum*, *Salix* x *reichardii*, *Solanum dulcamara*. (2) Well scattered, abundant in many places, in wet wooded area west of

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[847] Page, C.N. (1982). *The Ferns of Britain and Ireland*. Cambridge University Press, Cambridge.

					Childsbridge Lane (opposite Robinwood Drive), TQ 5463 5756, with northern aspect, near Folkestone Sands / gault clay interface, about 50m long parallel to road, and extending westwards for 15 to 30m. Drainage impeded by raised ground to the south, resulting in somewhat acid wet or swampy ground, overshaded by *Salix cinerea* with many recumbent trunks/branches and some *Salix fragilis* s.l., and carrying *Carex paniculata* (rare in Darent catchment), *C. remota*, *C. acutiformis*, *Iris pseudacorus*, *Dryopteris carthusiana*, *D. dilatata*, *Ribes nigrum*. (3) TQ 546 575. Wet wood by Childsbridge Lane, opposite Robinwood Drive, seen through the fence. (4) TQ55N
Angley Wood, Cranbrook	TQ7636		(1) 23 July 2022 (2) 17 June 2017 (3) 9 September 2000 (4) 14 July 1996	(1) WFS meeting (SL) (2) SL (3) JP & MT (4) JP (KFC meeting)	(1) Angley Wood, Tucker's Pond, TQ 7650 3682. Small plant separate from main colony. (2) Angley Wood, *Alnus*/*Scirpus* dominated carr woodland by junction of streams, TQ 76489 36834. About 60 small to medium sized fronds, confined to a 6m x 5m area of damp/not flooded ground, less dominated by *Scirpus sylvaticus*, under shade of tall alder trees, adjacent to opening in canopy. Associated species: *Carex paniculata*, *Scirpus sylvaticus*, *Carex vesicaria*, *Alnus glutinosa*. (2) KFC Bulletin No.42 (Jan 1997). [Records go back to before 1899; but up to 1950s/1960s the site was more open fen with *Menyanthe*s that bordered Tucker's Pond (no longer present). (3) TQ7636 (4) TQ7636.
Headcorn east – Sherway Bridge	TQ8644		(1) 14 June 2019 (2) 23 April 2019	(1) KBRG meeting (2) SL	(1) A large spread of plants in boggy woodland at TQ 8606 4447. (2) North-east of Little Luckhurst, the largest of four wooded ponds east of the public footpath, within an old clay pit, TQ 86056 44484 to TQ 86090 44486. Pond filled with peat and *Salix* swamp, with ancient woodland bordering the pit. Nine colonies spread across pond, but probably all one sprawling plant. Largest colony along a bund forming the southern edge of this pond, TQ 86072 44469 to TQ 86067 44476. No plants seen in the bordering ponds.
Dungeness	TR01T, includes TR0717	SSSI, National Nature Reserve	(1) 20 June 2020 (2) 2012 (3) 2002 (4) 27 June 1996	(1) SL (2) BB & BF (3) BB (4) EGP	(1) Dungeness, Open Pits, TR 07513 17946. Phragmites bed within Open Pit 3. (2) RSPB survey; results mapped above. Pits 2 (part) and 3 are in TR0717. (3) TR 0750 1796, Pit 3, hundreds. (4) TR01T
Dungeness	TR01U, includes TR0618,	SSSI, National Nature Reserve	(1) 24 August 2020 (2) 20 June 2020 (3) 14 June 2020	(1) AW (2) SL (3) SL	(1) TR0618. (2) (a) TR 07258 18140. Northern end of Open Pit 2, small area within

	TR0718		(4) 4 June 2018 (5) 13 May 2017 (6) 27 November 2016 (7) 10 July 2016 (8) 2012 (9) 25 July 2012 (10) 15 June 2010 (11) 2002 (12) 9 June 1997 (13) 26 June 1996 (14) Before 1981, after 1970	(4) AW (5) SL (6) SL, BBS (SE) meeting (7) KBRG meeting (8) BB & BF (9) SB (10) GK (11) BB (12) FR (13) EGP (14) Philp (1982)	*Phragmites* dominated open fen. (b) TR 07296 18090. Northern end of Open Pit 2, along the *Phragmites* dominated edge of the remaining open water body. (3) Denge Beach, between Open Pit 1 and power station approach road, TR 0780 1850 to TR 0776 1856. A small natural pit formed in the shingle, with a wet floor. At northern end. (4) TR0718. (5) Open Pit 1, TR073184. Floating peat raft and northern edge of open water. (6) TR 0652 1838, west side of Open Pit 6 (*Cladium* Pit), *Phragmites* dominated peat in wet open fen. This year's dead fronds still present in strip of uncut *Salix*/*Phragmites* growth. (7) Abundant at edges of Pits 2 and 8. (8) RSPB survey; results mapped above. Pits 5 and 6 are in TR0618 (also 7 where present but not mapped); Pits 8, 1 and 2(part) are in TR0718. (9) TR 0664 1834, frequent in *Cladium* Pit. (10) TR 0723 1827, well scattered in area where willow scrub removed. (11) Open pits: (a) TR 0734 1806, Pit 2, thousands. (b) TR 0664 0182, Pit 5, hundreds. (c) TR 0657 0183, Pit 6, thousands. (d) TR 0671 1848, Pit 7, hundreds. (e) TR 0718, Pit 8, thousands. (f) TR 0741 1843, Pit 1, thousands. (12) Cladium Pit, Denge Beach; locally very abundant – best in most open areas. (13) TR01U (14) TR01U
Dungeness	TR01Z, includes TR0818		30 July 2011	TI	TR0818.
Ham Fen	TR35H, includes TR3354, TR3355	SSSI, KWT reserve	(1) 13 July 2013 (2) 9 August 2002 (3) 18 July 1997 (4) 25 July 1991 (5) 1991-98	(1) KBRG meeting (2) JP (3) JP (4) JP (5) EGP	(1) Very large population in true fen vegetation from TR 33433 54944 to TR 33444 54922 (and beyond) in association with *Phragmites australis*, *Carex panicea* and *C. elata*, *Galium uliginosum* etc. Ham Fen KWT Reserve. (2), (3) & (4) TR3355. (5) TR35H.

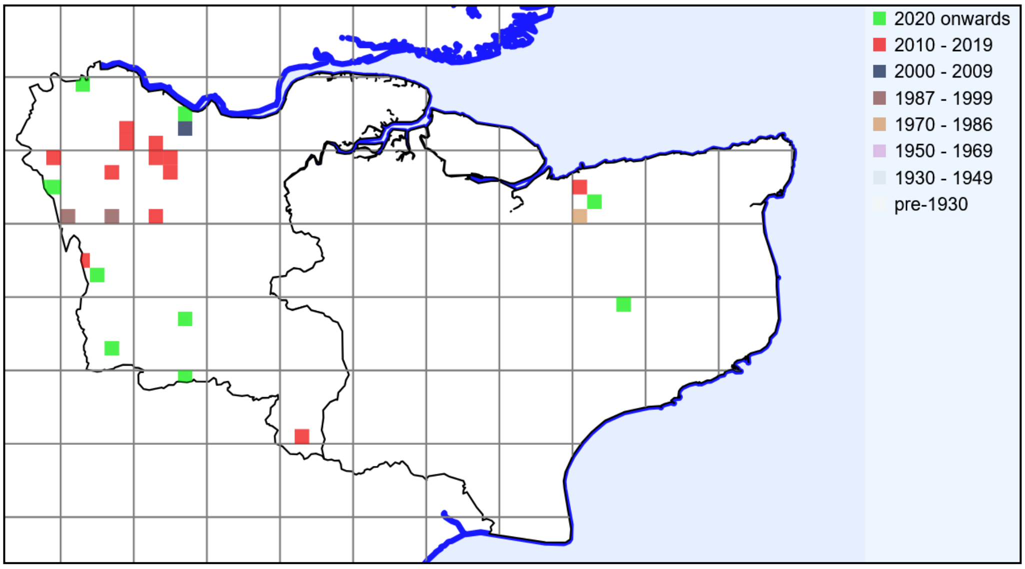
Tilia cordata Mill. (Small-leaved Lime)

vc 15 & 16

Rarity / scarcity status

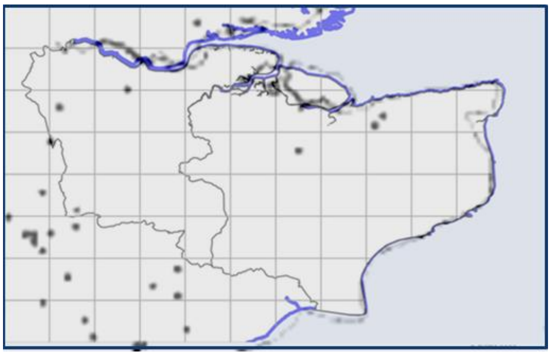
Tilia cordata is, as a native tree, locally common in England (mostly in central parts) and Wales, but is widely planted and this has obscured its native distribution. In England and in Great Britain as a whole, its conservation risk status is one of 'Least Concern'. In Kent, Philp (1982) recorded it as native (or at any rate, not obviously planted) at three tetrads in the administrative county, which would render it rare. Taking into account metropolitan vc16 as well, it is better regarded as **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

The problems of ascertaining rarity/scarcity are illustrated by the accompanying distribution map, from the BSBI database records. The cluster of records in metropolitan north west Kent might suggest that this is, to an extent, a record of the presence of botanists who were prepared to record trees which were not in the wild, and with little or no comment as regards status (only two Kent records within Greater London are labelled 'planted'). There are, however, apparently good native occurrences amongst them, and the map is less misleading than the version prepared for the April 2023 issue of this register, after which the BSBI database was cleansed of many records of planted taxa.



***Tilia cordata* Kent records to 2024 mapped at tetrad level, from BSBI database.**

For a (perhaps) more realistic view of native occurrences, a further map is given below, extracted from Pigott (1991)[848] which illustrated the native distribution in the British Isles, compiled from various sources, and on which we have overlain the East Kent and West Kent vice county boundaries and the Ordnance Survey grid. The overlay may not be fully accurate, but the picture is clear enough in broad terms: that assemblages of *Tilia cordata* records generally may be expected to resolve into very few indeed which may be reasonably treated as native.



Native distribution of *Tilia cordata* in the British Isles, 1991 (extract: Kent).

Account

Not only is there a problem as regards ascertaining the status of records, whether native or otherwise, (and some botanists have maintained that it is not a native Kent species); but there is also an issue as regards why there are so few possibly relict native records in ancient woodland at all. This might be considered surprising in the light of the extensive occurrence of *Tilia cordata* in Kent Holocene woodland.

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[848] Pigott, C.D. (1991). Biological Flora of the British Isles: Tilia cordata Miller. *Journal of Ecology* **79**: 1147-1207.

Glacial cover at the last glacial maximum (22000-27000 BP) did not reach Kent, but snow fields and frozen ground would have affected it, and trees only returned gradually, beginning with birch and pine, hazel, then elm and oak and later, with the Atlantic period, *Tilia cordata*. Pollen from the latter has been found in mid-Holocene sediment samples in Kent, with an early date of 7650 BP at Holywell Coombe, Folkestone, after which it became increasingly frequent as a major constituent of primary woodland in Britain. There will have been Kent woodland where *Tilia cordata* was dominant (the extent of which is only limited by the availability and sampling of appropriate pollen sequences). These include the south east Wealden forest, which will have extended to Kenardington and Warehorne, overlooking Romney Marsh, where (at Horsemarsh sewer) pollen samples from deposits with radiocarbon dates of 5150 BP and 5500 BP were dominated by tree pollen, especially *Tilia cordata* and *Quercus* (Oak). The former may have accounted for >90%, and pure lime stands would have characterised plateau soils, slopes and perhaps even marsh clay[849].

Farningham Wood coppice. Photo by Stephen Lemon, 23 June 2012

After, then, but with some variation from place to place, there was a general decline in the presence of lime. Because of the reluctance of *Tilia cordata* to reproduce via seedlings other than in a sufficiently warm climate, ancient climate change (and there was a deterioration from *c*.3500 BP towards wetter conditions) could affect the ability of the species to return after decline, but seems unlikely to be a major cause of the decline itself; it may, however, have affected the depositional environment and hence the pollen record.

There is a clearer relationship with the activities of man, generally reckoned to have had an influence between 5000 BP and 3000 BP. But the human impact was spread over time: *Tilia* pollen virtually disappears c. 3900 BP from a sequence between 4600 BP and 2300 BP obtained from a borehole at Romney Marsh near Bilsington (although other indicators of human activity remain scarce)[850]. In contrast with early decline at some East Sussex sites, Kent locations near the uplands above Romney Marsh point to *Tilia*-dominated woodlands in the meantime persisting at the Wealden forest abutting the northern edge of the marsh, with high *Tilia* pollen values being recorded through to the end of peat formation at Chapel Bank, Shirley Moor (*c*. 3600 BP) and Horsemarsh sewer (*c*. 3300 BP).

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[849] Tooley, M. & Switsur, V.R. (1988). Water level changes and sedimentation during the Flandrian Age in the Romney Marsh area. . In (eds. Eddison, J., Gardiner M. & Long, A.) *Romney Marsh: Environmental Change and Human Occupation in a Coastal Lowland*. OUCA Monograph **46**: 31-44

[850] Long, A., Waller, M., Hughes, P. & Spencer, C. (1988). The Holocene Depositional history of Romney Marsh Proper. . In (eds. Eddison, J., Gardiner M. & Long, A.) *Romney Marsh: Environmental Change and Human Occupation in a Coastal Lowland*. OUCA Monograph 46: 45-63. Waller, M. (2002). The Holocene Vegetation History of the Romney Marsh Region. In (eds. Long, A., Hipkin, S. & Clarke, H.) *Romney Marsh: Coastal and Landscape Change through the Ages.* OUSA monograph **56**: 1-21.

There are other Kent records of *Tilia* [851]pollen, including:

- from Wingham, a depositional sequence 1700BC-200AD (Bronze Age, pre-Roman Iron Age, part Roman occupation), showing *Tilia* decline and virtual cessation c. 1200BC (now c. 3400 BP)[852]
- from Frogholt, Folkestone, similar.
- From the Wantsum channel, a depositional sequence from c. 4700 BP onwards showing (Middle to Late Bronze Age) the presence of mixed woodland, especially oak and hazel, bur with a *Tilia* component which thereafter declined; this is thought to have been a consequence of marine inundation – only later (Iron Age) does the quantity of weed and cereal pollen suggest true woodland clearance for agriculture.[853]
- From Ashford, pollen sampling suggesting that substantial clearance had already taken place but that some remaining stands of mixed woodland included limited *Tilia* presence. Separate Romano-British sampling indicated similar vegetation.[854]
- From boreholes taken off the north Kent coast (cable routes north of Herne Bay serving a windfarm and east of Ramsgate providing an electricity connection to Belgium), and hence relating to land since lost to the sea level rises which separated Britain from the Continent, pollen sequences showed the presence of woodland (in sufficient proximity to contribute pollen): the oldest (from peat dated to 8240- 7840BC) did not include *Tilia,* but the later (6600-5970BC and 5890-5390BC) contained small quantities.[855]

While we have a basic picture of *T. cordata* declining over the Mesolithic period as a result of human impact, it is a patchy picture, with little direct evidence to assist as regards developments in relation to Wealden woodland. However, it appears that the traditional view of the extension of primaeval Wealden forest into relatively recent times is not entirely accurate. Kaminski (1995) [856]reviewed research into Romano-British iron-workings and found that of all the trees which have contributed charcoal identified from such workings, there is not a single example of *Tilia*. Given that iron workings were widespread, this suggests that *Tilia* scarcely featured in the Wealden woodland any more by Roman times.

Farningham Wood coppice. Photo by Stephen Lemon, 23 June 2012

Comprehensive Wealden woodland clearance to bring about this result does not seem a wholly satisfactory explanation: woodlands obviously survived to fuel the Roman iron workings and much gill woodland would have been difficult to access and clear in any event. Rackham (2006)[857] remarks that it is quite a difficult tree to destroy!

Sansum & Ryland (2013)[858] have drawn together the threads of views expressed as regards other forms of human interference, and a more persuasive explanation would be that the known susceptibility of *Tilia* seedlings, saplings and coppice shoots to browsing suggests that one should not regard wood-pasturage as having begun with the Anglo-Saxons' seasonal transhumance of swine as between north Kent settled land and Wealden woodland dens. It may be that this activity began much earlier, and was responsible for the substantive disappearance of *Tilia* from the Weald. Its early decline in the pollen record in other parts of Kent, however, is more likely to reflect actual woodland clearance and conversion to cultivation.

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[851] Distinction is seldom made between pollen of *T. cordata* and *T. platyphyllos*, a t *T. cordata* is involved; the latter, although evidenced at a Mesolithic site at Addi

[852] Godwin, H. (1962). Vegetational History of the Kentish Chalk Downs as seen at Wingham and Frogholt. *Veröffentlichungen des Geobotanischen Institutes der Eidg. Tech. Hochschule, Stiftung Rübel, in Zürich* **37**: 83-99.

[853] Scaife, R. (1995). Pollen analysis from the Wantsum Channel. In (eds. Hearne, C.M., Perkins, D.R.J. & Andrews, P.)The Sandwich Bay wastewater treatment scheme archaeological project , 1992-1994. *Archaeologia Cantiana* **115:** 239-354.

[854] Allen, P. (2006). Pollen. In: Powell, A.B. & Birbeck, V. *Excavation of a multi-period site at Foster Road, Ashford, 2006. Archive report: Finds and Environmental*. Wessex Archaeology.

[855] Brown, A. & Russell, J. (2019). *Mesolithic geoarchaeological investigations in the Outer Thames Estuary*. Wessex Archaeology.

[856] Kamniski, J. (1995). *The environmental implications of Romano-British iron production in the Weald*. PhD thesis, University of Reading.

[857] Rackham, O. (2006). *Woodlands.* Collins.

[858] Sansum, P. & Ryland, K. (2013). Tilia cordata (Small-leaved Lime) in gill woodland in the Weald of Kent. *BSBI News* **123**: 22-24.

Later evidence of continued survival of *Tilia cordata* may be afforded by Kent place-names which are associated with lime (OE *lind*). There is always ambiguity as to whether such a name exists because lime trees were generally frequent in the area or, conversely, whether they were rare and a single tree warranted creation of a place-name. However, there seem to be very few such Kent names and this may itself be a measure of rarity.

Lindridge is a location on a ridge at Lamberhurst Quarter along which the A21 runs[859]. Hasted (1798)[860] takes Lindridge as a local personal name back to 1566. But it may be identical with Lindhryc mentioned in an Anglo-Saxon charter granting swine pasturage rights (dated 762, but probably 747) and another of 764[861]. *Tilia* is not now known here.

Lyndhyrste/ Lindhyrst features in a charter of 995 as a swine pasture used by Littlebrook and in charters of 955 and 998 as a reference point[862]. This was near Edenbridge and may relate to what is called Lynhurst Farm, north of Edenbridge, on older Ordnance Survey maps. *Tilia* is not now known here, either.

Lind cylne/ Lind ceolne is given in a charter of 814 in connection with a swine pasture used by Bexley lands. Witney (1976)[863] equates this with the western boundary of Hever around Brocas and with Lynkell/Lynkill (1540/41), an appendage of the manor of Orpington, reflected later in being, as the borough of Linkill, an administrative anomaly, comprising detached fragments of Ruxley hundred (one fragment extending from Brocas to the Cowden boundary, the other at Four Elms in Hever). These fragments are shown on the 1869-70 Ordnance Survey and the first of them points to a link between old *lind* place-names and present-day *Tilia cordata*, because one of the very few current sites (Dogpits, discussed below) clearly lies within the detached Brocas-Cowden fragment.

Dogpits, Hever. Photo by Philip Sansum, 30 August 2012

So far as concerns botanical records, Hanbury & Marshall (1899) state that it had been recorded from a good many parts of the county, usually as planted trees, and had no real claim to be a native. Not everyone recorded the status: Forster in his *Flora Tonbrigensis* (1816) simply states that it was 'At Groombridge and elsewhere, not uncommon', but may have thought it native, given that he distinguished *Pinus sylvestris* (Scots Pine) as 'not indigenous' but did not say this of Small-leaved Lime. Francis Rose noted it as regarded as native in Surrey and Sussex, and certainly so in Essex, but 'it does not occur certainly native any where in Kent today'. Eric Philp changed his mind over status. In Philp (1982) he referred to it as introduced, with self-sown plants in Farningham Wood and at least one fine tree in Church Wood near Canterbury, but did not rule out potential for discovery as a native in the Weald. In Philp (2010) he gave the species as native, recorded from Farningham Wood, Clowes Wood and Tunbridge Wells Common. This seems improbable as regards the Common, where old views show a much more open landscape than today, albeit with obvious tree planting; Francis Rose marked a record from here as introduced and we have found a tree at TQ 577 387 which looks likely to be so.

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[859] There is also a Lindridge at Staplehurst, the name of a house dating back beyond 1500 (i.e. the house, not necessarily the name, although this is attached to a farm in the 1839-42 tithe award). A link to early place-names has not been traced.

[860] Hasted, E. (1798). The History and Topographical Survey of the County of Kent, vol. 5. W. Bristow, Canterbury.

[861] Campbell, A. (ed.) (1973). *Charters of Rochester.* Oxford University Press.

[862] As above.

[863] Witney, K.P. (1976). *The Jutish Forest*. The Athlone Press, University of London.

A selection of post-1970 records has been made in the table below, omitting those which are obviously planted or derived from introductions. Some of these are selected for further comment here.

The first such site is **Dogpits**, near Hever, discovered by Kate Ryland in 2012. This lies in a mosaic landscape of varying levels, of pasture, wooded gill valleys and small shaws. There are about 38 limes, both trees and coppiced stools, mostly concentrated in an irregular shaw around a flooded pit at the head of a small tributary running down to a wooded gill valley; and although a few trees are more scattered, all could be encompassed by a circle of 220m diameter. The underlying geology is of the Wadhurst Clay and Ashdown (sand) Formations and the site is likely to be at the boundary; the occasional calcareous tendency of the Wadhurst Clay Formation may have been the cause of the pit excavation – marl was frequently extracted for agricultural purposes in the 16th to 18th centuries and earlier. The immediate environs of the limes carry an ancient woodland flora and there is no indication of estate planting, nor would it have served any purpose to have planted in conjunction with the marl excavation. The continuity with ancient lime-related place-names is mentioned above and the colony has good persuasive status to be native. Further details are given in the table below and in Sansum & Ryland (2013).[864]

Farningham Wood coppice stool. Photo by Stephen Lemon, 23 June 2012

Farningham Wood also looks persuasive, although we have not been able to trace records earlier than 1950, when Francis Rose variously recorded two trees/a few coppiced specimens; Ron Boniface (who was with him) noted it as occasional. It is an SSSI, noted for geological diversity (sands and gravels of the Thanet and Harwich Formations, and Lambeth Group, overlaying chalk), which is accompanied by a rich ground flora with many ancient woodland indicators. Mapped representation of the wood goes back at least to 1769, but there is nothing to suggest previous woodland discontinuity other than the presence of chestnut coppice. *Castanea sativa* (Sweet Chestnut), an introduced species, is of course frequent in Kent and its presence does not preclude a wood from being ancient. Jarman *et al.* (2019)[865], for example, describe the woods west of Mereworth as having stools typical of coppice planted in the eighteenth to nineteenth centuries into existing oak-hazel wood; and the flora of Farningham Wood also very much suggests older woodland into which chestnut has been introduced, with the result that *T. cordata* then became coppiced alongside. As Pigott (1991)[866] remarks as regards *T. cordata*, 'Its presence often indicates long persistence of woodland…but this does not imply that either the structure or the species composition of the woodland is natural. Almost all woodlands in Britain are to a greater or lesser extent the product of past or present silvicultural treatments'. Recent records of *T. cordata* for which we have 6-10 figure grid-references are below shown plotted onto an aerial view, and their scattered nature appears more consistent with native survival than any planting.

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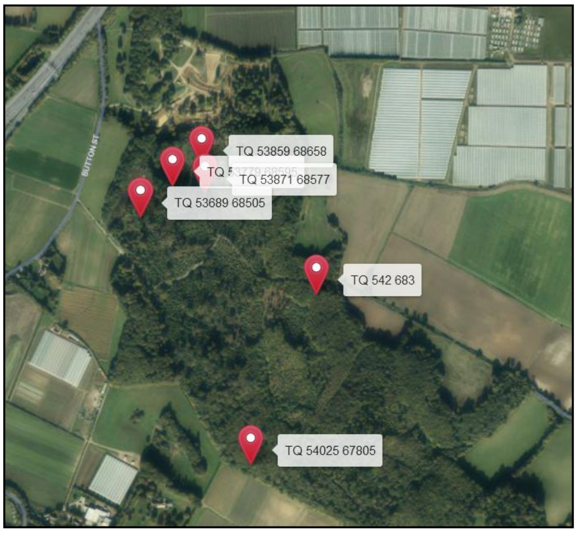
[864] Op. cit.

[865] Jarman, R., Chambers, F.M. & Webb, J. (2019). Landscapes of sweet chestnut (Castanea sativa) in Britain – their ancient origins. *Landscape History* **40**: 5-40.



Farningham Wood with *Tilia cordata* records from 2010 onwards.

Spring Park Wood, West Wickham, is a steep-sloping site which geologically bears some similarities to Farningham Wood with the presence of Harwich Formation pebbles above, at the base of which springs emerge, flowing over Lambeth Group clays and silt, thence sinking into Thanet Formation sand. The acid, but variable, soil conditions are accompanied by a range of ancient woodland indicator plants and the degree of slope would limit its historic use other than for woodland. It was formerly part of the Wickham Court Estate manorial woodland which, according to the 15th and 16th century manorial accounts, generated significant income. The woodland comprises *Quercus robur* and *Q. petraea* (Pedunculate and Sessile Oaks), *Castanea sativa* (Sweet Chestnut), *Corylus avellana* (Hazel), and some *Betula pendula*, *B. pubescens* (Silver and Downy Birches), *Fagus sylvatica* (Beech) and *Alnus glutinosa* (Alder). Its assessment in the 1980s as a Site of Nature Conservation Interest mentioned the Small-leaved Lime:

> 'present, as large overmature coppice stools, young trees and old pollards. Several large old pollards occur along the old County boundary between Croydon and Bromley on the western perimeter of the wood. This is probably the largest population of lime in the county'.

Spring Park Wood: left, pollards; right, wind-thrown trunks. Photos by Alan Heyes, 6 August 2022

The evidence appears good here for native status; the line of pollards on the Kent/Surrey county boundary where here is a linear earthwork, posssibly of great antiquity, may suggest planting, but it is possible that the significance of the line in boundary terms has contributed to a historic reluctance to remove trees from it. This and other linear locations may mark woodland compartment edges. A 2022 survey of the trees was reported in Kitchener (2022)[867]; they were numerous along the boundary and were widespread through the woods on both sides with signs of re-generation. Some trees were truly enormous. Many were multi-trunked, showing the influence of coppicing in the past and resulting in very wide stools; sometimes it was difficult to ascertain whether there were independent trees or a stool which had become so wide that its parts had separated. Trees leaning from wind-throw were not uncommon, perhaps due to growing on a slope. Such trees then developed vertical shoots from the leaning trunks. If trunks fell to lie horizontal on the ground, then the effect of the vertical shoots would be to give rise to a line of new trees.

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[866] Op. cit.

[867] Kitchener, G. (2022). Small-leaved Lime in Kent: recording at West Wickham. *Kent Botanical Recording Group newsletter* **15**: 19-21.

Spring Park Wood: left, pollards; right, wind-thrown trunks. Photos by Alan Heyes, 6 August 2022

Clowes Wood is part of the Blean complex of woodlands, noted as both ancient and extensive. It lies on the Thames Group (London Clay), which includes sands and gravels as well as the predominant clay, and provides a somewhat acid and infertile substrate. *Hasted in The History and Topographical Survey of the County of Kent* (vol. 3, 1790) noted the northern part of the Parish of Bleane as 'all coppice wood, among which is a considerable part of the great tract called Clowes wood'; as 'Cluse' its name goes at least back to the 13th century. Forestry Commission conifer planting has resulted in some reduction of diversity. *T. cordata* was noted in the 1980s as occurring as relict coppice stools and an occasional young tree in the fringes of Clowes Wood rides and this seems persuasive as a native occurrence.

It is noticeable that these sites considered in detail above have some common features of geology which would be consistent with a pattern identified by Pigott (1991)[868] in that, although *T. cordata* grows naturally on a wide range of soils, in English lowlands it is characteristic of stagnogleys developed on shallow, compact, fine-textured soil material, frequently non-calcareous. Such a soil, often formed on sand-rich material over silts and clays, is poorly aerated and badly drained, liable to water saturation over winter and drying out in summer.

Sometimes, the occurrence of the species has a claim to be native, but the circumstances may raise query. A population in a Wealden gill near Hawkhurst has a persuasive claim in that gill woodland ought to provide a habitat for long-term continuity, given the frequently steep-sloping terrain inhibiting clearance or replanting. The site also had an excellent ancient woodland flora; but *T. cordata* here was in the general vicinity of planted conifers and the age profile of the population did not suggest antiquity.

Dogpits, Hever. Photo by Philip Sansum, 30 August 2012

A population on the Kent/Surrey county boundary near Finkleshole echoes the boundary occurrence further north, at Spring Park Wood, but lacks association with woodland. Native occurrence might require an assumption that the Roman road which it lines was cut through woodland with *T. cordata* still present and that any subsequent clearance respected the growth which defined the line of the *agger* (and also the boundary significance which it acquired). This assumption, however, is challenged by the reported co-presence of *Tilia platyphyllos* (Large-leaved Lime) and its hybrid with *T. cordata* (*Tilia x europaea*). The former does not have a current Kent native presence[869], its appearance in the Holocene pollen record for Kent is rare in comparison with *T. cordata*, and the coincidence of all three taxa, while not without precedent in Kent pre-history, challenges any explanation other than planting.

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[868] Op cit.

[869] For its occurrence in peat, assumed of Neolithic date and sealing a Mesolithic site at Addington, see Burchell, J.P.T. & Erdtman, G. (1950). Indigenous *Tilia platyphyllos* in Britain. *Nature* **4193**: 411. The peat samples included lime (frequency about 10%), and of the lime pollen grains investigated 5% were *T. platyphyllos*, 75% *T. cordata* and *T.* x *europaea* (the remaining 20% were indeterminate). As regards native survival, at one stage Francis Rose considered that he had found c. 1957 a possible candidate in a group of trees scattered

In distinguishing *Tilia platyphyllos*, *T. cordata* and *T. europaea,* flowers are useful (if the tree has them), as those of T. *cordata* are held in groups of 5-20 obliquely erect, above the foliage: with the other two taxa, they are pendent, among the foliage, *T. platyphyllos* with them in groups of 1-5. Fruits of *T. cordata* are either sterile, when small and spherical, or fertile, when 6-8 x 4-5mm unribbed with brown tomentum; fruits of *T. platyphyllos* are usually fertile, 9.5-12 x 8.5-11mm (i.e. nearly spherical), ribbed with whitish tomentum. T. *cordata* leaves are mostly 3.5-7cm, glabrous on the upper surface and also (except for patches of stellate hairs in the vein axils and often running along part of the vein at the base) the lower surface. *T. platyphyllos* leaves are (4-)6-11(-13)cm, upper surface with sparse simple hairs along the main veins, lower surface with simple hairs along the main veins and often over the whole surface. *Tilia* leaves from sprouts or shade may not be typical. As regards the hybrid, its characters show a wide range of intermediacy, e.g. flowers in groups of 4-10, fruits c.8 x 7cm, leaves 6-5 x 6-12cm.

This account owes much to Stephen Lemon and Philip Sansum.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Spring Park/ Threehalfpenny Wood, West Wickham (metropolitan vc16)	TQ3764, TQ3864	Public open space owned by Corporation of London	(1) 06 August 2022 (2) 28 May 2020 (3) 3 May 2020 (4) 9 November 2019 (5) 1 December 2011 (6) $ April 2006 (7) May 1986	(1) KBRG / SBS meeting (2) RG (3) RG (4) GK (5) Species Management Plan (2012) (6) JP (7) JP	(1) see annex at end of table. (2) TQ 3792 6467, very close on vc boundary. (3) TQ 3818 6499. (4) TQ 37850 64765, a large semicircle of trees, a couple of them coppiced, near London Loop Path in acid chestnut and oak woodland on Lambeth Group clay/sand/gravels, close to vc 16/17 boundary. Looks native. (5) Survey included vc17 and found 132 trees, of which 22 (9%) were pollards (including both veteran lapsed pollards and trees cut once only, after the 1987 storm); 33 maidens (24%); 20 phoenix trees (i.e. vertical trees formed from windblown trees or stems) (15%); 44 overstood coppice (33%); 23 young coppice/non-linear phoenix trees (i.e. trees coppiced with last 30 years etc., plus trees which had been windblown but regenerated from root-plate or stem base, not from stems) (17%); and 3 saplings (2%). This was a more comprehensive survey than that of 6 August 2022 and included a concentration of tres towards the north eastern boundary of Spring Park on the lower slopes and a line leading towards this along the south eastern lower boundary which the later survey did not cover. (6) TQ 383 648. (7) TQ 382 650. [Recorded at least back to 1895, but some in 1956 noted to be in parallel rows. There are also records for the vc17 part of the wood.]
Finkleshole (metropolitan vc16)	TQ3960		21 June 2013	GF	TQ3960, Skids Hill Lane, former Roman Road, forming the vc16/17 boundary. Three trees on the West Kent side, nine on the Surrey side. *T. platyphyllos* and *T. x europaea* also on both sides. (Also by Fairchildes Lane in nearby Surrey.) [Apparently known to DP as on the Roman Road agger.]
Dogpits, north	TQ4643		(1) 6 May 2021	(1) GK	(1) TQ 4686 43741, a large tree at edge of

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along a stream in a remote valley amidst native vegetation in Combwell Wood (site since ascertained to have been TQ 7034 3399 - TQ 7033 3403. On revisiting in 1990, however, he decided that these were *T.* x *europaea* and probably planted.

east of Markbeech			(2) 24 April 2016 (3) 10 January 2016 (4) 30 August 2012 (5) 4 May 2012	(2) SL (3) SL (4) PS (5) KR	pond at Dogpits. There were also smaller trees on the wooded slopes running down to the pond, not counted, but one note as having been coppiced in the past and so multi-trunked, with stool now 10ft across. *Lathyrus linifolius*, *Orchis mascula* and *Moehringia trinervia* also recorded. (2) East of pond in Dogpits woodland, lower down slope, beside the ditch feeding from pond, TQ 46915 43753. Small coppiced tree close to a small standard tree (possibly same individual?). Missed when visited on 10/01/2016. (3) (a) Dogpits, a small woodland with pond, south of Hever Warren. Single tall *Tilia* tree with large trunk on southern side of pond (TQ 46866 43741). 13 smaller, mostly coppiced trees west of this, (includes very large coppiced tree by pond and three closely growing coppice stools possibly once a single stool), growing on steep slopes all around the western half of the pond, approx 75m contour, including where a ditch joins wood from the south and creates a small gill, with most trees occupying upper slopes and headland (c. TQ 4684 4375 to TQ 4684 4376). 22 coppiced trees continuing on flat ground above slopes at edge of the wood, including 16 coppiced trees that form a line on a low bank along the edge of the wood (c. TQ 4681 4375 to TQ 4682 4372). One coppiced *Tilia* tree isolated from main population in a fence line at the very far end of the north eastern arm of the wood (TQ 46907 43847). Tilia apparently absent from rest of Dogpits woodland which is mostly dominated by large oak and beech. All *Tilia* trees observed here are assumed from previous investigation to be *T. cordata*. Balance of evidence indicates *T. cordata* is more likely to be native here, based on these finds and historic evidence from 1799 and 1869 OS maps, which suggests Dogpits woodland is ancient woodland within a wider ancient countryside layout of (formerly) small fields with linear shaws/hedges joining onto it and no obvious signs that the area was ever part of a landscaped estate. Evidence against native origin is the high number of *T. cordata* trees here when they are unknown elsewhere historically in the Kentish Weald and the relatively straight line of 16 T. *cordata* trees along the low bank that perhaps suggests originally a planting and not natural origin (unless a fallen tree which has layered). (b) South of Dogpits woodland, 3 coppiced *Tilia* trees (all dying) among *Quercus robur* trees (TQ 46753 43714). A small isolated group of trees on plateau within an improved grassland. *Tilia* trees are 100 metres from the main Tilia population in the Dogpits woodland to the north east. The OS Maps from 1869 onwards and Google Earth satellite imagery from 1940s to 1990s confirm this small group of trees was an extension to the now small shaw to the south and was grubbed out between 1990 and 2003. This extension previously joined the shaw to the Dogpits woodland in the north. The irregular shape of this shaw suggests it was of ancient origin rather than more recent estate landscaping

					and goes toward supporting a native status for the *Tilia* population. (4) Material confirmed by DP. (a) TQ 468 437, c.12 coppice stools mixed with *Corylus avellana* occupying the slope overlooking a waterlogged pit at the head of a small and shallowly incised tributary valley. Associated species included: *Bromopsis ramosa, Carex remota, Carex sylvatica, Chysosplenium oppositifolium, Crataegus laevigata, Euphorbia amygdaloides, Schedonurus giganteus, Ilex aquifolium, Malus sylvestris, Melica uniflora, Potentilla sterilis, Primula vulgaris, Rosa arvensis, Veronica montana* (all ancient woodland indicators). Site overlies junction of Wadhurst Clay and Ashdown Sand; pit was probably for extraction of marl, siderite and/or clay; calcareous influence suspected. (b) TQ 46804 43498, 1 or 2 stools at head of tributary to 'Oak Wood' gill woodland system. Associated species included: *Carex sylvatica, Malus sylvestris, Veronica montana.* (5) TQ4643, Ancient Woodland Inventory revision survey.
Joydens Wood	TQ4971, TQ4972, TQ5071		(1) 16 May 2013 (2) 1998 (3) July 1979	(1) RMB & JC (2) JP (3) JP	(1) Numerous seedlings and saplings, TQ 496 719; also TQ4972. (2) Several old stools and young trees on margin, TQ 495 718. (3) TQ 500 716.
Farningham Wood	TQ5368, TQ5467, TQ5468	SSSI	(1) 6 June 2015 (2) 28 June 2012 (3) 23 June 2012 (4) 21 May 2011 (5) 13 May 2011 (6) 9 May 2010 (7) 1990 (8) 13 May 1984	(1) KBRG meeting (2) SL (3) SL (4) MC (5) SB (6) MC (7) LNHS (8) RMB & JP	(1) single tree by footpath at TQ 54025 67805. (2) TQ 53779 68595. 12 coppice stools / two trees, along and slightly set back from a raised bank beside a woodland track, surrounded by Chestnut coppice. (3) A group of closely spaced coppice stools within the northern part of the wood, strung along the edge of a track running below two steep opposite-facing slopes at TQ 53859 68658. There were ten stools of no more than ten years' re-growth with a few saplings and a single much older maiden tree. Also older re-growth coppice stools higher up on one of the steep slopes at TQ 53871 68577. These areas were dominated by old Sweet Chestnut and Oak coppice with some younger Chestnut coppice. Soil comprises a lot of pebbles and sand. (4) TQ5368, Farningham Wood Button Street car park, waste ground. (5) single tree at TQ 53689 68505. (6) TQ 542 683 ancient woodland, Farningham Wood East. (7) TQ 536 684, near west corner, one tree, 10ft. (8) Old pollard a few yards north of gate, TQ 535 685; another north, (?)sapling on boundary bank TQ 536 686. [24 trees in the wood altogether, JP, 1980s.]
Hextable, Rowhill	TQ5271		17 July 2017	JP	Paxwood guide camp, old relict coppice stool, 100+ yrs old.
Hawkhurst / Flimwell	TQ7331		6 May 2014	GK	Wealden gill woodland: many trees on wooded slopes both sides of gill stream, but mostly on the south side, from (easterly) TQ 7397 3161 (valley is planted with conifers further east) to (westerly) TQ 7378 3152. None appearing coppiced (albeit the occasional basal shoot appears naturally) and most seeming similar-aged, not particularly old (the age profile being a little surprising if this is a relict population), but a few larger

					ones at east end of distribution, the largest having bole of c.180cm circumference. Appears to be the same population as mentioned by Sansum & Ryland in *BSBI News* 123 as recorded by L. Hutcheby in 2000 in Mopesden Wood. Many good ancient woodland species in this wood, *Cardamine amara, C. bulbifera, Narcissus pseudonarcissus,* etc. Associated trees: *Alnus glutinosa, Fagus sylvatica, Sorbus aucuparia, Acer pseudoplatanus, Carpinus betulus*.
Church Wood, Harbledown	TR15E, TR16A		(1) 13 June 1985 (2) Before 1981, after 1970	(1) KJKK (2) EGP & JK	(1) TR 110 600, Blean Woodlands Vegetation Survey. (2) TR15E, at least one fine tree (Philp, 1982, where species is labelled as introduced).
Covet Wood	TR1748		13 June 2024	AJ	TR 1772 4880. Possibly native trees in valley bottom, Covet Wood.
Covert Wood, Kingston	TR1848		12 June 1998	JP	TR 182 485 [TR 183 488?]. [Francis Rose's Flora of Kent has an undated record by G. Peterken for Covert Wood.]
Clowes Wood	TR16G Includes TR1263, TR1363		(1) 12 June 2024 (2) 20 April 2019 (3) 12 August 2012 (4) 2006 (5) 1991-99 (6) 1987	(1) AL & JM (2) SC & ML (3) KK (4) KWT (5) EGP (6) SMC	(1 TR 1368 6272. One tree in Clowes Wood. (2) TR1263. (3) TR 13264 63380. (4) [TR 127 621 – not an accurate grid reference], occurs as relict coppice stools and occasional young trees along rides in Clowes Wood. (5) TR16G. (6) Lies along the ride edge between compartments 155 and 156.
Park Wood, Wootton	TR2245		November/ December 1984	JP	TR224450 [probably generic reference for this part of SNCI, actual location may be TR 222 449.]. Soils derived from Thanet Sands, varied coppice and large stand of small leaved lime coppice in good order [may be c.30 stools on steep west-facing slope].

Annex: Spring Park Wood survey of 6 August 2022

Spring Park Wood (KBRG/SBS joint meeting), south-west of West Wickham. Small section of sloping Castanea woodland with high number of Tilia trees, on both sides of path along the southern edge of the wood up to the V.-cs. 16 and 17 boundary. 25 trees: TQ 37955 64696 (9' wide coppice stool along path, 3'' diameter re-growth, satellite suckers), TQ 37941 64701 (three 1-2' wide coppice stools on slope above path, 4'' diameter re-growth), TQ3793864707 (4' wide coppice stool near path, 4'' diameter re-growth, sucker growth), TQ 37937 64688 (three coppice stools along path, two on bank above and one on edge opposite, 3'' diameter re-growth), TQ 37930 64685 (Two small raised coppice stools on edge of path, 4'' diameter re-growth), TQ 37921 64700 (two coppice stools ten metres above path, the first 5' wide with formerly old trunks cut recently at 4' high sprouting 4'' diameter re-growth, the other 3' wide with 2'' diameter re-growth), TQ 37922 64691 (old fallen tree on ground 15-20 metres above path with re-growth along old trunk and root-plate, old re-growth up to 1' diameter and newer re-growth from recent coppicing), TQ 37911 64679 (1.5' wide Maiden tree, ten metres above path), TQ 37907 64685 (Two 3-4' wide coppice stools above path, 5'' diameter re-growth and old layered stem sprouting re-growth), TQ 37911 64676 (Two 1' wide coppice stools near path), TQ 37921 64677 (Very tall maiden tree along path with sucker growth), TQ 37922 64667 (10' wide old coppice tree or perhaps old suckers?, below path, with four trunks, the largest 3-4' wide), TQ 37906 64660 (Two small maiden trees and one small coppice stool either side of path, 2-6'' diameter stems / re-growth), TQ 37902 64654 (1' wide coppice stool along path on vice-county boundary, 2-3'' diameter re-growth), TQ 37917 64662 (2' wide maiden tree below path).

Trichomanes speciosum Willd. (Killarney Fern)

vc 16

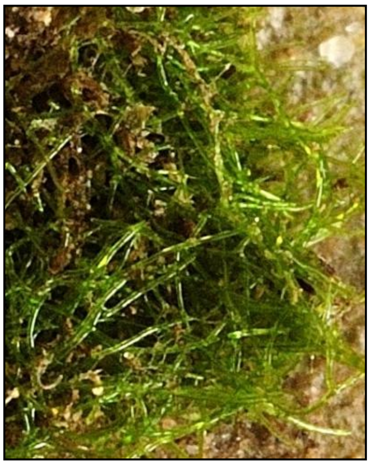
Rarity / scarcity status

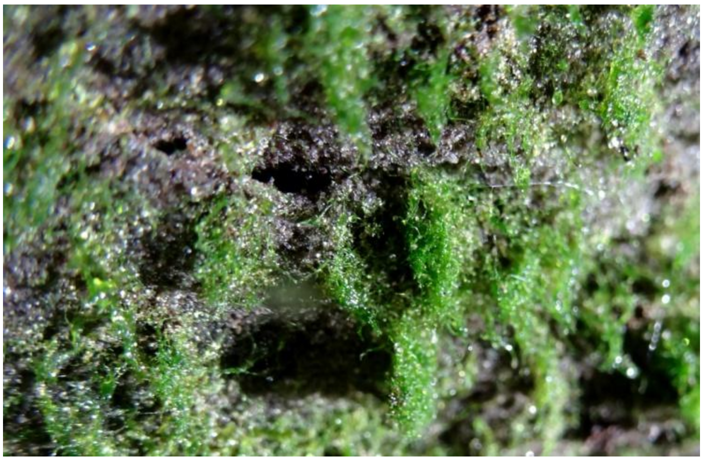
Killarney Fern as a mature plant with fronds (the sporophyte stage) is an extremely local plant of the western parts of the British Isles, in constantly damp, shaded localities. This growth stage of the plant is nationally scarce. Although the conservation status of the fern in England and in Great Britain as a whole is one of 'Least Concern', it is listed in the Wildlife and Countryside Act 1981 (as amended) as a species which should not be sold. Although it lacks the normal Schedule 8 protection against picking, it also has the status of a European protected species for which The Conservation of Habitats and Species Regulations 2017 (as amended) provide protection from picking or sale, whatever the stage of development of the plant.

As an immature plant (the gametophyte stage), and never maturing to frond production, it is more widespread in the British Isles, although very restricted in its habitat preferences. The gametophyte stage was overlooked in the wild until 1989 and was not found in Kent until 2015-17, where its four sites in caves or cracks in sandstone qualify it as **scarce, bordering on rare** in the county.

Account

It is likely that the presence of the gametophyte plants is of extremely long standing (potentially thousands of years) and is evidence of survival from warm and wetter climate conditions, when plants were able to grow to maturity and produce spores. Rumsey *et al*. (2005)[870] considered the species in a European context as having undergone post-glacial spread, with some glacial refugia having contributed to this distribution. Its survival in Kent and other drier part of the British Isles is based on its restriction to undisturbed habitats with an absence of competition, a microclimate of high humidity, and (having regard to its reluctance to colonise at a distance) an absence of unfavourable conditions at any time which could extinguish a colony.





Stridewood Rocks. Photos by Lliam Rooney and Stephen Lemon, 9 January 2016

The gametophyte looks like moss or algae from a distance, but grows as a mat of entangled filaments, often branching at right angles so as to give an appearance of three-dimensional wire netting, whose rigidity gives an impression of textured resilience when touched. From these filaments occasionally project unicellular brown or colourless rhizoids and hammerhead-shaped gemmae which, if detached, may serve to establish the plant clonally in the vicinity. Small wisps of plants have been observed by a main colony in Kent, presumably deriving from such origins. Indeed, it may be that the Kent colonies are being favoured by the wet and relatively mild climate of recent years; they appear to be more extensive than those Wealden colonies which were viewed by Fred Rumsey in the 1990s (personal communication). The characteristic rhizoids and gemmae, together with antheridia, were observed on Kent material, assisting with identification, and distinguishing from filamentous algae.

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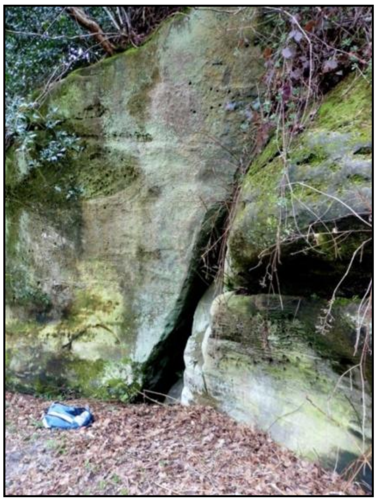
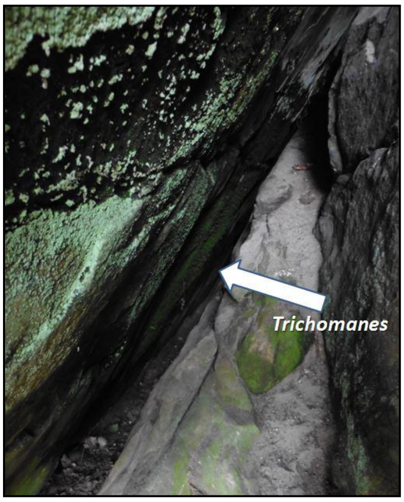
[870] Rumsey, F.J., Barrett, J.A., Gibby, M., Russell, S.J. and Vogel, J.C. (2005). Reproductive strategies *and population structure in the endangered pteridophyte Trichomanes speciosum (Hymemophyllaceae: Pteridophyta). The Fern Gazette* **17**: 205-215.

Gametophytes in the British Isles were first found in 1989 in the Lake District, North Wales and the Yorkshire Dales (Rumsey and Sheffield, 1990[871]); and in the 1990s a number of records were made in East Sussex in places such as West Hoathly, Wakehurst, Balcombe and, most relevantly to Kent (being some 2km from the vice county boundary near High Rocks), Eridge Rocks[872]. Ardingly sandstone (the Ardingley Sandstone Member of the Tunbridge Wells Sand Formation) takes the form of exposed, but shaded, outcrops at Eridge Rocks, High Rocks and on the Kent side of the vice county boundary here, so that there are comparable habitats throughout. Locally, *Trichomanes speciosum* gametophytes were first found at a cave in the Friezland Wood extension of High Rocks in East Sussex (vice county 14, but within the administrative county of Kent), and at neighbouring outcrops (**Hungershall Rocks**) near Tunbridge Wells in West Kent (vice county 16) by Stephen Lemon in 2015/16. Subsequently he discovered plants at other Ardingley sandstone outcropping**, Stridewood Rocks**, Chiddingstone Hoath (2016), and **Redleaf Rocks**, Penshurst (2017), as well as on sandrock which is part of the Folkestone Formation under Oldbury Stone at **Oldbury Hill** (2017).
These four sites are considered in turn, below.

Hungershall Rocks
The following account is an abbreviated version of a report prepared by Stephen Lemon and Geoffrey Kitchener in 2016, based on a survey of 20 March 2016. Hungershall Rocks (TQ5538) are Ardingly Sandstone outcrops on private land without public access, surveyed with permission; they form a small, sheltered valley lying between 75 and 80 metres altitude in the High Weald, through which runs a small wooded ghyll stream, a tributary of the River Grom, partly piped underground. The south end of the valley faces towards High Rocks on the East Sussex side of the Grom and is not far from a vice county 14 site for *Trichomanes speciosum* in the Ardingly Sandstone outcrops of Friezland Wood, a continuation of High Rocks. The geology at Hungershall Rocks is quite complex. In addition to the Ardingly Sandstone, there are also the Grinstead Clay and Tunbridge Wells Sand Formations. Both the Ardingly Sandstone and Grinstead Clay are also faulted here against the Lower Tunbridge Wells Sand. These junctions of the sands and clay with a fault line are presumably responsible for the spring lines that flush over some of the sandstone rock faces.

Eight locations for *Trichomanes. speciosum* within the Hungershall Rocks site were identified.





No. H1
This location is on the west side of the valley, facing eastwards, and is a near-vertical cleft in the face of the rocks in which the left hand side, tilting at an angle of c.60° over the floor, carries an extensive colony. The *Trichomanes* is in deep shade, its growth only beginning 1.5m into the

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[871] Rumsey, F.J. and Sheffield, E. (1990), British Filmy-Fern Gametophytes. *The Pteridologist* **2**: 40-42

[872] Rumsey, F.R., Jermy, A.C. and Sheffield, E. (1998). The independent gametophyte stage of *Trichomanes speciosum* Willd. (Hymemophyllaceae), the Killarney Fern and its distribution in the British Isles. *Watsonia* **22**: 1-19.

cleft and extending a further 2m in. The colony extends over an area 2 x 1.2m and is absent from the rock at and just above ground level, presumably because of animal passage.

No. H2

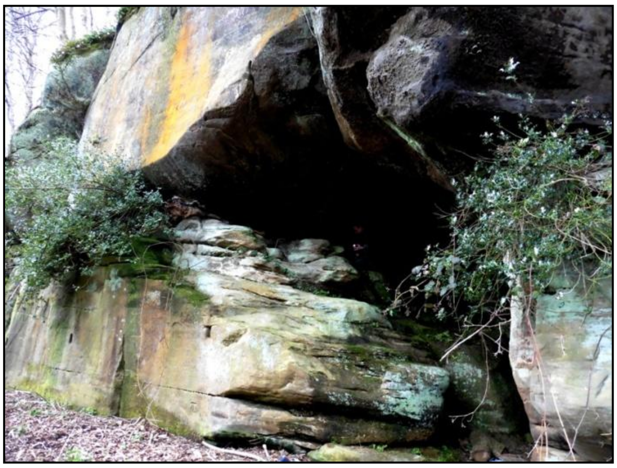
This location is on the west side of the valley, facing eastwards and is a large cave whose ceiling springs from a bedding plane which recedes, sometimes deeply, into the side walls, so as to provide a shelf. The angle between ceiling and shelf seems particularly favourable for growth of the *Trichomanes*, where it is tucked away. The cave is 1.4m wide at the mid-point, the entrance 1.3m high, and the bedding begins to shelve at about 1m above ground level. The extent of natural light reaching the cave interior is probably diminished by bramble growth, although this had been strimmed back at the time of visit. The light was sufficient for the *Trichomanes* to grow up to 3.3m deep into the cave. Seven groupings of *Trichomanes* were recorded, generally on the cave ceiling or in bedding plane recesses.

No. H3

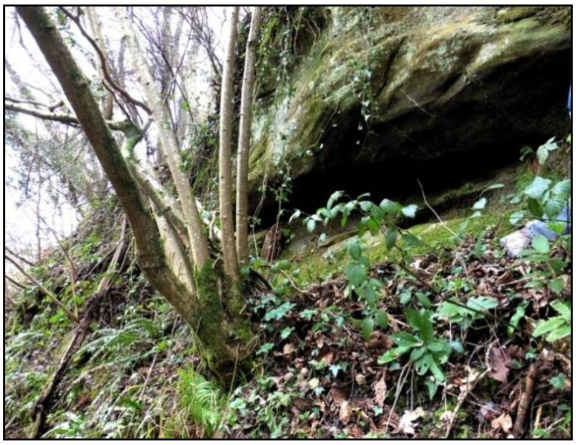
This location is on the west side of the valley, facing eastwards, and is a small cave whose natural light is diminished by the projection on the south side of a large outcrop. The left hand side, on which *Trichomanes* mostly grows, rises up at an angle of 45° to the floor and it meets the right hand side so as to form a triangle of c.90°. The formation appears to be the product of a massive rock collapse in antiquity, with the cave underneath where two rocks rest against each other. *Trichomanes* was recorded on both left and right hand rock faces, on the former up to 1.5m from the entrance.

No. H4

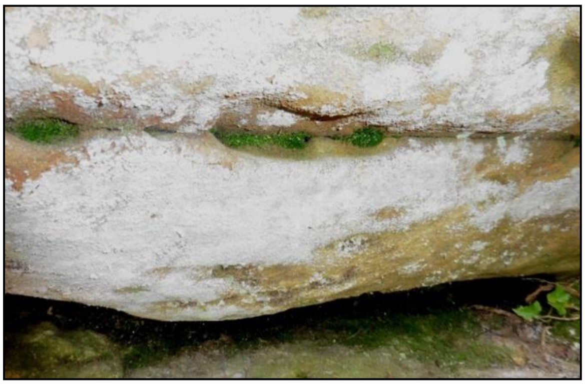
This location is on the west side of the valley, facing eastwards, and comprises a massive open cave, next to a rock face which appears to have been quarried away. The cave has an extensive overhang, some large collapsed blocks, and the area most favourable to *Trichomanes* is where the ceiling overhang dips as a rear wall down to some sloped shelving, forming the equivalent (on a larger scale) to the bedding plane / ceiling joint seen in other sites. Within a ceiling cleft in this area two patches were noted. The ceiling of this cave contained a colony of the rare sub-alpine Atlantic moss *Tetrodontium brownianum*.



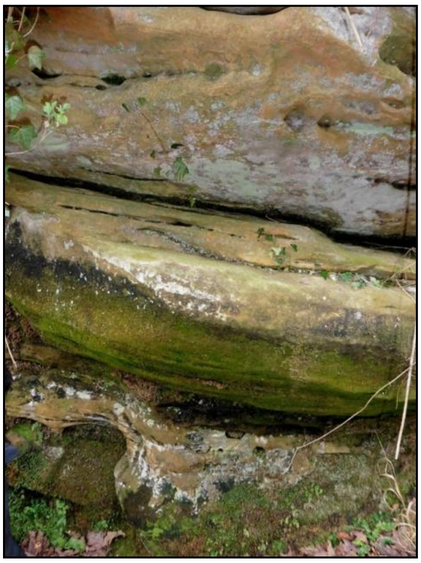
No.H5



This location is on the south west side of the valley, facing north east, by the corner of an equestrian sand school which occupies the valley floor. There is no cave, but a slightly hollowed-out overhang. There were a couple of small patches of *Trichomanes*, not readily measurable because of the admixture of bryophytes, unsurprising in view of the shallow nature of the site, which was fairly light-exposed (but not to direct sunlight).

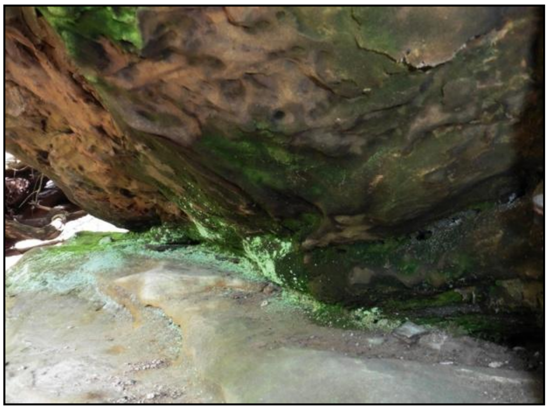


No. H6



This location is the furthest up the valley, sited on the south west side, facing north east. It consists of a large, bulging outcrop, in which the bedding planes have eroded back, so as to provide recessed, near-horizontal cracks. *Trichomanes* was found in these cracks, and is presumably more extensive in the vicinity, but difficult to detect, mixed with more dominant bryophytes, encouraged by high humidity.

No. H7



This location is on the eastern side of the valley, facing west south west. It is anomalous as regards the extent of light exposure, but appears to have been long sheltered before by a yew tree which has collapsed down the valley slope. It comprises a bulging rock outcrop, with *Trichomanes* growing along the recessed horizontal junction of a bedding plane between a flat shelf of what appears to be the usual Ardingly sandstone and, above, a rock with substantial ironstone content. *Trichomanes* was noted as growing across 2.1m of the recessed junction. The level of light exposure is probably the reason for the presence of sporelings of (presumably) *Dryopteris dilatata* (Broad Buckler-fern) in the same junction. It is not clear whether *Trichomanes* has a long-term future here if the yew is removed or decays; there is probably already some exposure to direct sunlight.

No. H8

This location is on the eastern side of the valley, facing west and is to the north of No. H7. It comprises a rock overhang or very small cave. The surrounding rocks are directly exposed to sunlight, but the back of the overhang appears sufficiently set back to avoid this, although at the front the light supports juvenile *Dryopteris dilatata* (Broad Buckler-fern). The rocks above and to the left are dripping wet from a spring line, presumably the junction of the Ardingly Sandstone with the Grinstead Clay or perhaps their faulting against the Lower Tunbridge Wells Sand. They support tussocks of *Luzula sylvatica* (Great Wood-rush), and are a wetter location than the other *Trichomanes* sites at Hungerhall Rocks.

Stridewood Rocks

The following account is an abbreviated version of a report prepared by Stephen Lemon and Geoffrey Kitchener in 2016, based on a survey of 9 January 2016 with Lliam Rooney. Stridewood Rocks[873], south west of Chiddingstone Hoath, are an outcrop of Ardingly Sandstone running east-west alongside pasture dropping northwards into gill valley woodland for about 800m, of which about 500m carries intermittent crags with vertical rock sections facing northwards.

Four locations for *Trichomanes speciosum* within the Stridewood Rocks site were identified.

No. S1

This location is just to the west of a public footpath which diagonally traverses the outcrop. It was a small, burrow-like hole in a north east facing rock, surrounded by *Dryopteris dilatata* (Broad Buckler-fern) and *Rubus fruticosus* agg. (Bramble). A patch of *Trichomanes* was located on the ceiling within, at the right hand side.

No. S2

This colony was found a little further west along the outcropping from No. S1. It grew in a north facing carve-out or depression in the rock face, with a crack angled away, not fully visible in the accompanying photo, towards which the yellow light stand is directed and within which there was a small patch of *Trichomanes*. This location is fairly shallow in terms of distance and protection from the open environment.

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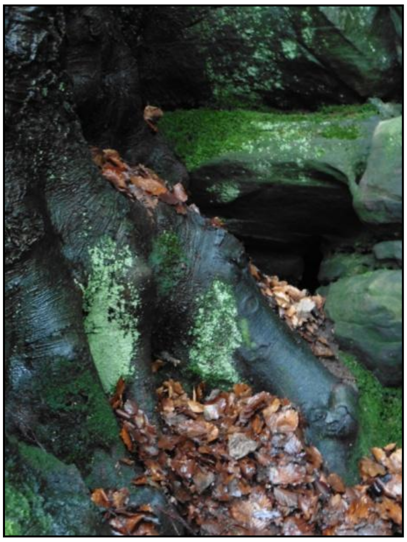
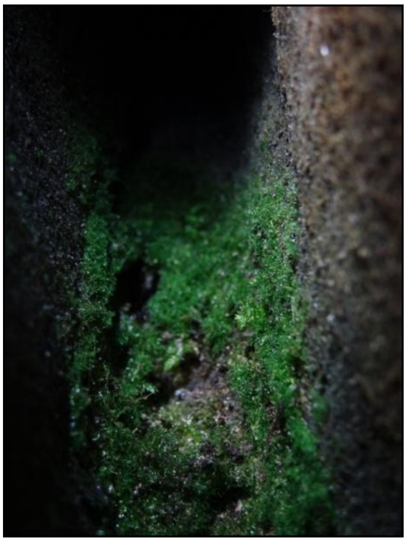
[873] Stridewood Rocks, so named by Francis Rose in his *A Bryophyte Flora of Kent,* being one of the sites treated there as 'sandrocks of the Forest Ridge'. The woodland over the rocks is called Stridewood Shaw on some maps.

Above and to the right was a separate colony, a shallow pocket in the rock face with a small patch of *Trichomanes*. This, again, was a shallower habitat than might be expected.

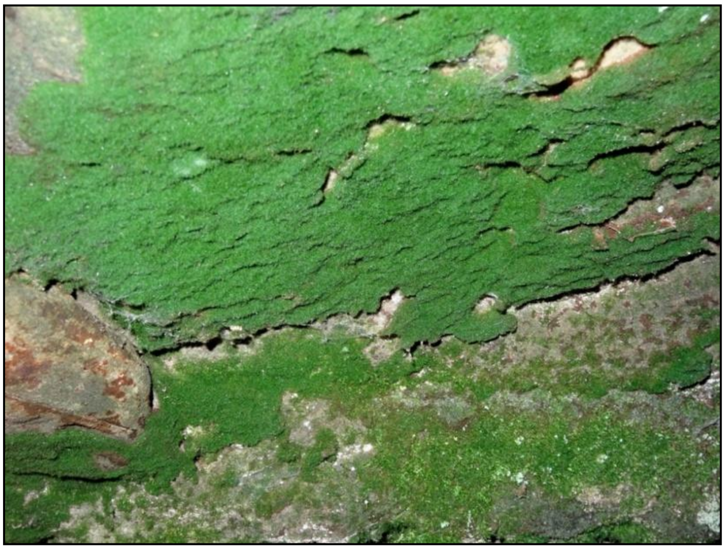
No. S3





This location comprises a small cleft in the rocks next to a large beech tree whose roots flowed over the rock face and into the cracks. The cleft was indirectly angled into the rocks without much internal exposure to light. *Trichomanes* was seen well into the cleft, a patch c. 9 x 15cm.

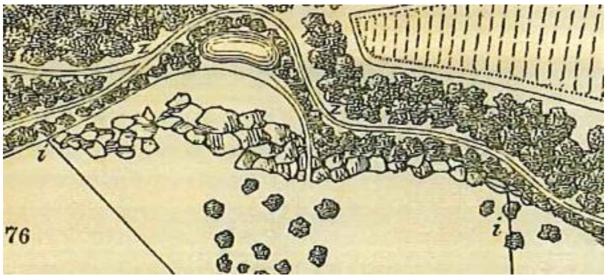
No. S4

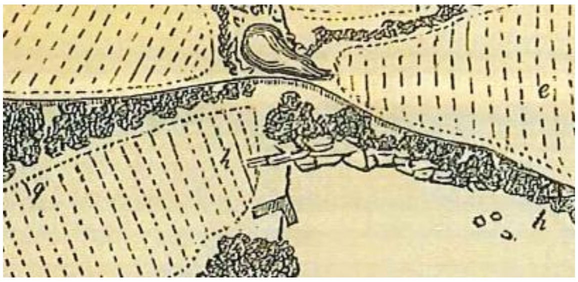


This was the largest colony, set in a cave with a triangular opening, its floor along a bedding plane. *Trichomanes* was present in extensive patches across the ceiling of the cave towards the far end, reaching towards the entrance mainly in the crevices at floor level on each side. The colony began about 1.30m in from the cave entrance and extended for about 1m until the far end. The maximum width of the cave where the *Trichomanes* was present on both sides was 1.30m. The size and continuity of the ceiling patches was particularly impressive. It appeared that this site had probably been screened for many years by an oak tree, whose remaining root plate and lower trunk was lying, fallen away from the rock face.

Redleaf Rocks

Redleaf Rocks, Penshurst are a more northerly outcropping of Ardingly Sandstone rocks than the previous sites, and they form the southern boundary of woodland, The Grove, as well as being part of the Grade II listed park and garden of the now-demolished Redleaf House. *Trichomanes* gametophytes were found here by Stephen Lemon in 2017. There was a very small amount, tiny mats tucked into deep crevices formed on the eroding bedding planes of two shallow caves. Despite the south-facing aspect of these rocks, the cave habitat is sheltered, perhaps orientated slightly to the west. It is notable that, both at this and other sites, *Trichomanes* does not seem to colonise rock surfaces which have been modified, at least in historic times. Here it was adjacent to larger quarried caves with mortared stonework, which may be the product of landscape gardening from the early 19th century onwards, when the outcrop was treated as a garden natural feature. Alterations here by William Wells were described in the *Gardeners Chronicle* (1839[874]) and the original state of the outcrop was given as 'Ledge of sandstone rock, rising several feet above the surface, 30 ft. or 40 ft. In width, and much weather-worn; presenting an appearance, at a distance, which reminds one of the surface of some parts of the Giant's Causeway; the rock having separated into polygonal faces, with chasm between, indicated by strongly marked lines'. 'Before' and 'after' improvement illustrations were given (see below) in which the original line of rocks (to the right) appears more or less maintained.





Oldbury Hill, Ightham

Trichomanes was found here by Stephen Lemon in 2017, towards the top of a wooded scarp slope facing north east with outcropping rocks of Oldbury Stone from the Folkestone Formation which accommodate Middle Palaeolithic rock shelters. It is the most easterly occurrence in the British Isle, except for Hastings (East Sussex). This site is disjunct from the other Kentish, more southerly, sites and the geology is different, not comprising Ardingly Sandstone. It is, however, sandrock and may have similar characteristics of porosity. It is a layer of about 15 ft depth, and underlies the harder Oldbury stone, which is also exposed here but does not seem so suitable, although it protects the sandrock from erosion above and presumably facilitated cave formation out of the softer rock beneath.

Other Kentish sites suggest that *Trichomanes* shuns rock surfaces which have undergone quarrying or other anthropogenic modification, at least in historic times. It is not easy to be certain about modification of the Oldbury site, since although the effect of Palaeolithic occupation (c. 50,000 BP) is irrelevant to the presence of *Trichomanes* (as this would have arrived after the last glacial maximum, c. 22, 000 BP, and with a wetter climate than at present) there will have been disturbance in historic times – not just the archaeological excavation of Palaeolithic shelter floors

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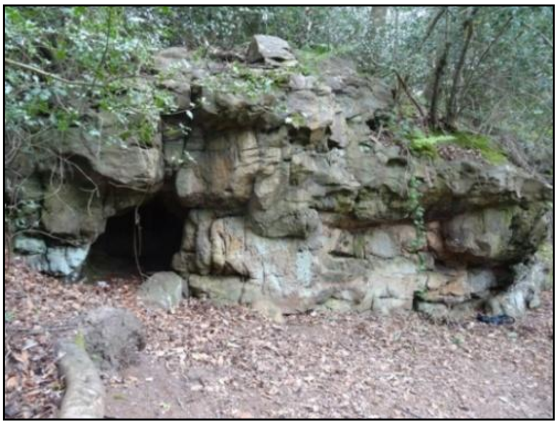
[874] Loudon, J.C. (1839). Descriptive Notices of select Suburban Residences, with Remarks on each; intended to illustrate the Principles and Practice of Landscape Gardening. No. 12. Redleaf, the seat of William Wells, Esq., F.H.S. *The Gardener's Magazine* **5**: 353-379.

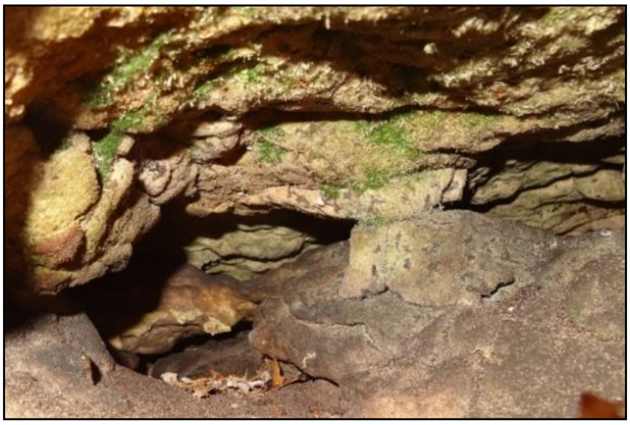
(for which, see the accompanying illustration of Benjamin Harrison,[875] at the location described as No. O1 below), but also earlier quarrying of the Oldbury Stone overburden. A good indicator of unmodified rock is the presence of a surface honeycombed by weathering (apparently a product of long-term alternation of wet and dry conditions).

Two locations at Oldbury Hill have been noted, c. 20m apart.

No. O1.

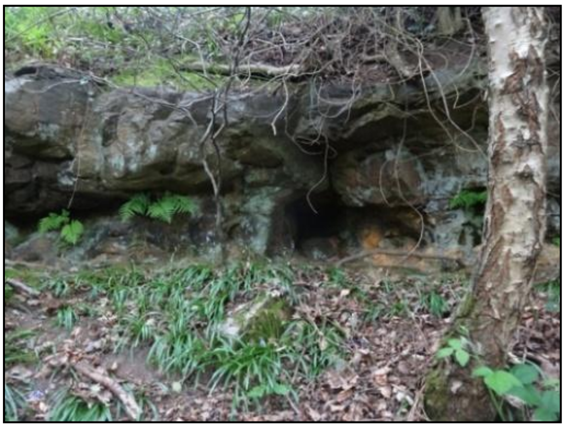
Gametophytes were observed, where the rock face held a large cave at the southern end and showed honeycomb weathering along the lower half. There were small broken patches of gametophyte (pure patches no more than 1-2cm wide) on the northern half of the rock face in dark sheltered narrow crevices below overhanging rocks and further around the rock face in a wider crevice.

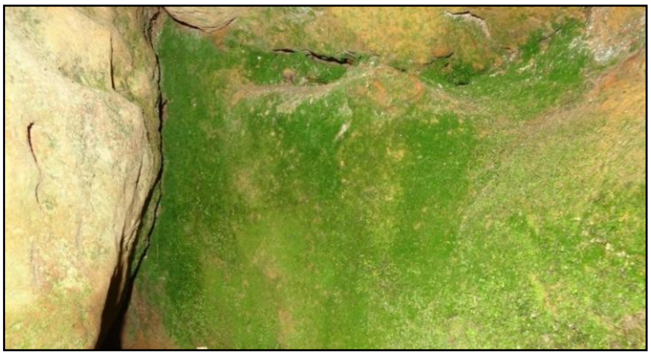




No. O2

Southwards of location No. O1, the second location comprised a low linear rock face with a small cave containing a large almost pure (except for sparse amounts of moss/liverwort of 'Atlantic' character) mat of gametophytes covering a couple of square feet of the back wall, c. 2m in from the entrance.





There are common characteristics of the various Kent sites, which enable some conclusions to be drawn.

There are two main type of habitat. One is the recessed angle penetrating the bedding planes of the rocks. As a result, the colonies are usually linear, along the horizontal bedding planes. Presumably this usually has the advantages of greater moisture, of being tucked away from disturbance and of reducing light (and hence competition). However, *Trichomanes* was seen in recessed bedding plane angles outside caves as well as inside, so the light aspect may be to a degree incidental. The second habitat type comprises caves or overhangs with limited light exposure, where gametophytes have been seen in clefts or on cave walls and ceilings. It has been recorded up to 3.3m inside, beyond reach of competition by mosses and liverworts. The more exposed sites outside caves were more likely to have competing bryophytes growing in the same sites, and in the lightest places, other pteridophytes. It is possible that *Trichomanes* is much more common than as surveyed, but has reached an accommodation with the bryophytes so that sometimes what looks like a moss colony is actually interwoven with *Trichomanes.* Only one location (Hungershall Rocks, H7) seemed to be subject to direct exposure to sunlight, and this is a site whose character has altered through tree collapse.

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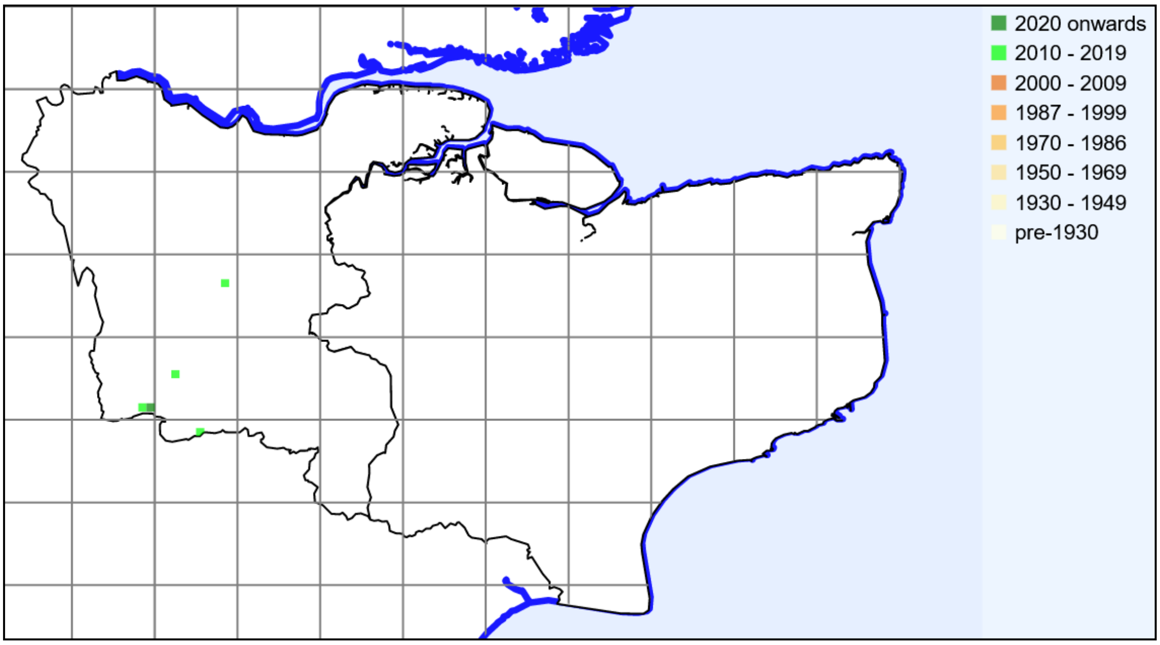
[875] Clinch, G. (1905). The Neolithic Dwelling. *The Reliquary and Illustrated Archaeologist* N.S. **11**:25-37

Whereas the *Trichomanes* sporophyte (not seen) is a plant of wet habitats with high humidity, the preference of the gametophyte in Kent sites seemed to be for relatively dry habitat, although in the context of a humid microclimate. Where the caves, crevices and overhangs were noticeably wet, with vigorous bryophyte growth, *Trichomanes* was not observed. The apparently dry sandrock surfaces on which *Trichomanes* was seen will, however, may still have afforded a water supply through the known porosity of Ardingly sandstone (disguised by its protective crust which forms on exposed surfaces) and it may be that the bedding planes where it often grows are lines of seepage. So there is a degree of paradox here, that the overall context is one of a humid microclimate, in which ‘Atlantic’ bryophyte are also recorded (providing a link to former wetter climate conditions), but the surfaces on which *Trichomanes* has been seen growing here do not show their dampness.

Some locations where *Trichomanes* was not seen may have been unsuitable through the chemistry or porosity of the sandstone in the cave roofs examined, where they were devoid of even bryophyte growth, although *Trichomanes* is clearly capable of growing where bryophytes will not, and this is where the gametophytes are most conspicuous. Other locations are likely to have been affected by the passage of mammals for shelter, if able to rub against the cave ceiling or sides; or the nature of the habitat may have been adversely affected through tree root penetration and growth. The vicissitudes which may affect any such locations over the extremely long period for which the gametophytes have presumably been present must mean that the survival of the colonies has been a lottery; the surprise is that so much is still present.

Trichomanes speciosum **Kent records to 2024 mapped at monad level, from BSBI database.**



The mapping given above is more complete than that in *Plant Atlas 2020* which omits these and numerous other British and Irish records for 2000-19, although there has been referee validation of Kentish presence.

This account has greatly benefited from the researches and discoveries of Stephen Lemon; all photos are by him, unless otherwise indicated.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Stridewood Rocks	TQ4841, TQ4941		(1) 2 May 2021 (2) 9 January 2016	(1) SL (2) SL, GK & LR	(1) Same site as 2(d) below, although noted as TQ 4926 4171. Small cave in north face of Ardingly Sandstone rock outcrop with gametophyte still abundant over roof and back corners of cave. (2) **(a)** See under **S1** above for principal record details. TQ 48950 41783. **(b)** See under **S2** above for principal record details. TQ 48923 41797, two colonies, of which the upper one was recorded also as having abundant *Pseudotaxiphyllum elegans* and smaller amounts of the liverwort *Calypogeia fissa.* **(c)** See under **S3** above for principal record details. TQ 49224 41737. **(d)** See under **S4** above for principal record details. TQ 49270 41716.
Redleaf Rocks	TQ5245	Grade II listed park & garden	15 January 2017	SL	See main text above for principal record details. TQ 52322 45555 and TQ 52307 45555. Small amounts of the gametophyte in both caves forming tiny mats growing with moss *Tetraphis pellucida*, deeply set into narrow crevices along an eroded bedding plane. Rocks were cleared of Rhododendron in 2014. Previous negative searches carried out further west along this line of rocks and smaller rock face along the western side of The Grove.
Hungershall Rocks	TQ5538		20 March 2016	SL & GK	**(a)** See under **H1** above for principal record details. TQ 55955 38575 [Note Grid references were difficult to pinpoint in this valley, especially when near rock faces. Two GPS receivers were used, the results compared and tested against a Google earth based grid referencing facility. The references given here and below are an amalgam from all three sources but even so, have limitations.] **(b)** See under **H2** above for principal record details. TQ 55953 38604. *Trichomanes* was recorded as follows (working from the left side inwards, then the right side outwards): • a broken patch 1.4m inside the entrance, spread over 40cm long of the ceiling on the left; • a patch 1.8m inside the entrance, tucked into the angle of the bedding plane on the left, 14cm long; • a broken patch some 18cm long, further inside, in the angle of the bedding plane on the left – signs of rodent activity (hazelnut shells) were present on the adjacent shelving; • a patch on the ceiling less than 2cm long; • a patch in the bedding plane recess 2 x 2cm, associated with presence on the ceiling too fragmentary for recording; • a very small (0.5 x 0.5 cm) patch on rock, apparently of different character to the surrounding matrix, facing the light deep inside the cave, associated with two patches each of 1 x 1cm and a grouping of *Trichomanes* between bedding plane and ceiling; • on the right hand side, furthest in, a broken patch some 45cm long, becoming more fragmentary away from the light. **(c)** See under **H3** above for principal record details. TQ 55956 38609. *Trichomanes* grew on the left hand rock face near the entrance loosely broken and mixed with bryophytes such as *Calypogeia* and *Cephalozia* spp., making assessment of its status difficult, although there was a small pure patch further in. The furthest point of growth was 1.5m from the entrance, although the massive rock projecting forward to the left of the

					entrance in effect provides much of the sheltering and light-diminishing effect of an entrance before the 1.5m begins to be measured. Unusually, a *Calypogeia* liverwort species was seen growing even further inside the cave than the *Trichomanes* - normally the latter seems to have greater tolerance of low light levels. Gametophytes were also seen growing on the right hand side, loosely broken and mixed with bryophytes, with a concentration over 15 x 10cm in a small recess at the entrance. **(d)** See under **H4** above for principal record details. TQ 5596 3862. The ceiling cleft patches comprised one measuring 2 x 1cm, mixed with a liverwort, *Cephalozia* sp.; and another 1 x 0.5cm, unmixed with bryophytes, but with the liverwort *Calepogeia arguta* beside it. **(e)** See under **H5** above for principal record details. TQ 55928 38655. **(e)** See under **H6** above for principal record details. TQ 55928 38655. *Trichomanes* was found in cracks, surveying from left to right: • a patch 2.5 x 1cm at 0.65m above ground level; • a colony extending for 1.40m along a crack, at times mixed with bryophytes including *Pseudotaxiphyllum elegans*; • below the previous colony, running for 30cm along a crack; • a colony within a hollowed out area, 6 x 1 cm, slightly less than 2m above ground level; • running for 20cm along a crack about 2m above ground level; • on the right hand side of the outcrop within a hollowed-out area, running along for 20cm. As with H5, *Trichomanes* is no doubt more extensive around this site, but not readily detectable when mixed with more dominant bryophytes; it was also seen within what at first appeared to be just a dense patch of *Heterocladium heteropterum* var. *flaccidum*, another Atlantic taxon generally of more western and northern distribution. This site shares the same environment as adjacent H5 along with the high humidity. **(f)** See under **H7** above for principal record details. TQ 55989 38623. **(g)** See under **H8** above for principal record details. TQ 55987 38627.
Oldbury Hill	TQ5856	SSSI	(1) 14 April 2018 (2) 17 April 2017	(1) KFC meeting, SL (2) SL	(1) Present where recorded in 2017 (2) **(a)** See under **O1** above for principal record details. TQ 58412 56502. **(b)** See under **O2** above for principal record details. TQ 8397 56517. 'Atlantic' taxa also present were the moss *Pseudotaxiphyllum elegans* and the liverwort *Calypogeia arguta*.

Trifolium fragiferum L. (Strawberry Clover)

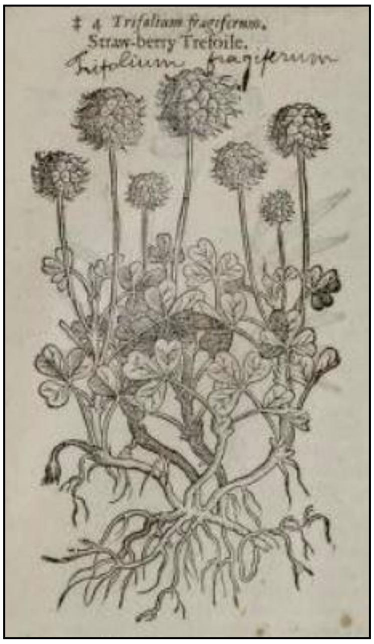
vc 15 & 16

Rarity / scarcity status

Trifolium fragiferum is a perennial clover well scattered in the British Isles as far north as south Scotland and growing in coastal grassland, as also on heavy soils inland. Its conservation threat status in both England and Great Britain as a whole is **Vulnerable** to the risk of extinction. A comparison of English data over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 33% reduction in the likelihood of recording the species. In Kent it is neither rare nor scarce, but there is evidence of a 58% decline (perhaps overstated) between 1971-80 and 1991-2005 which has been attributed (Philp, 2010) to loss of habitat, either through 'improvement' or ploughing up of old pastures, or through housing development. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first published Kent record was Thomas Johnson's find on 16 July 1629 (*Iter Plantarum*, 1629) on the saltings after leaving the high ground at Cliffe; this could have been in the Shorne Marshes area, where it is still present. As well as being the first Kentish record, it is also the first for the British Isles. Johnson was aware of it elsewhere, as he lists it in his *Decriptio Itineris* (1632) amongst plants found on the shore and steep cliffs of Margate (it is still known in the vicinity); and he stated that 'It growes in most salt marishes, as in Dartford salt marish' in his 1633 edition of Gerard's *Herball* (it is still to be found at Dartford Marshes).


‡ 4 Trifolium fragiferum.
Straw-berry Trefoile.
Trifolium fragiferum

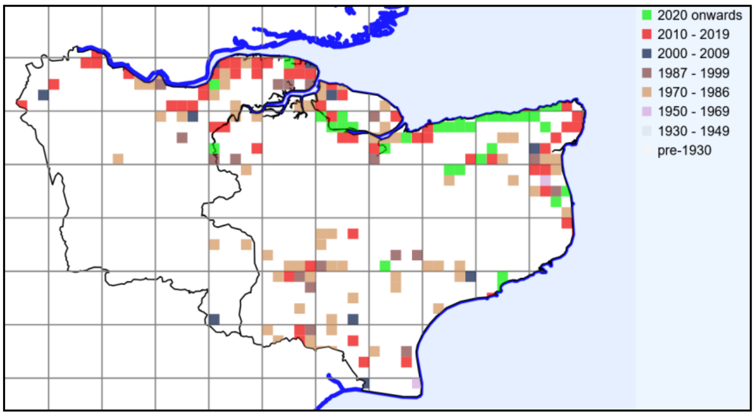
Trifolium fragiferum, from Gerard's *Herball*, ed. T. Johnson, 1633

The breadth of its occurrence was such that Hanbury & Marshall (1899) did not give any locations, describing it as a native of moist meadows and brackish marshes, found in all botanical districts but especially plentiful about the Thames and Medway estuaries and on the south coast. Francis Rose, noting records primarily in the 1940 and 1950s, also recognised it as common in brackish meadows along the Thames and Medway estuaries, with appearances on heavy clay pastures and roadsides inland, present in 23 out of 51 Kentish hectads. There was one somewhat anomalous record on chalk, a roadside verge at the Wrotham by-pass.

Ranscombe. Photo by Lliam Rooney, 24 July 2012

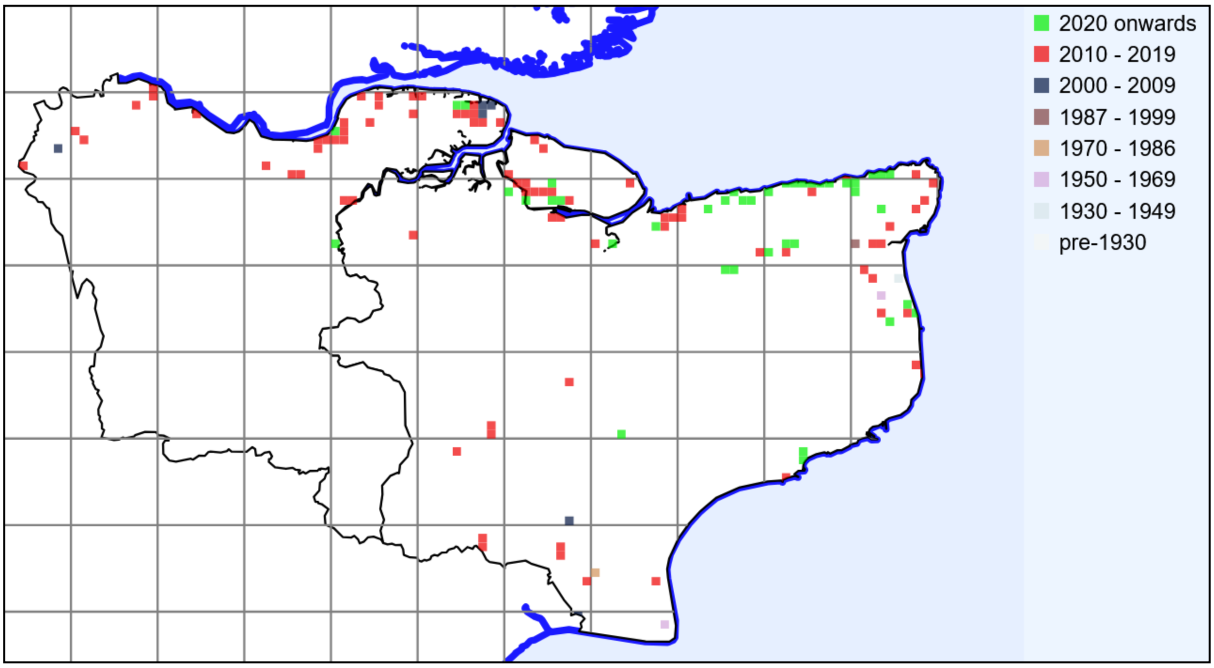
Philp (1982) recognised presence in 31 Kent hectads (107 tetrads); this may be assumed to represent more thorough recording, rather than an increase since the 1940/50s. The 107 tetrads, however, had become 45 by 1991-2005 (Philp, 2010), when the habitats of *Trifolium fragiferum* in old meadows and coastal grazing marshes, practically always on clay soils, were considered to have suffered loss. While that is likely to have been the case, the loss appears not to be as substantial, given that our 2010-24 records covered 92 tetrads (122 monads). The historical distribution of records is given in the map below at tetrad level, which was the standard recording unit of area from about 1970, and it will be seen that the principal losses are in the Weald, although there are also unexpected local absences, e.g. in the Sandwich area.

Trifolium fragiferum **Kent records to 2024 mapped at tetrad level, from BSBI database.**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Our rare plant register records are maintained at monad level, and so are four times more sensitive than tetrad recording, which was the norm in Kent up to 2010. The current position is shown below and clearly shows the predominance of north Kent coastal and estuarial grassland on London Clay.

Trifolium fragiferum **Kent records to 2024 mapped at monad level, from BSBI database.**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

Reculver. Photo by David Steere, 9 July 2018

Trifolium fragiferum is patch-forming, spreading through neighbouring vegetation by means of proliferating basal shoots which root at the nodes. Being low in stature, it grows best in short turf and is resistant to trampling, close continuous grazing or mowing; it is saline-tolerant and can cope with flooding (up to 20 days[876]).[877] Our records from 2010 onwards refer to presence on road-verges, grazing marshes, inside sea walls, short turf on track, lawns, near water (rivers, ditches, pools), consolidated shingle, mown cliff-top grassland; and with associated species *Trifolium repens* (White Clover) and *Trifolium squamosum* (Sea Clover).

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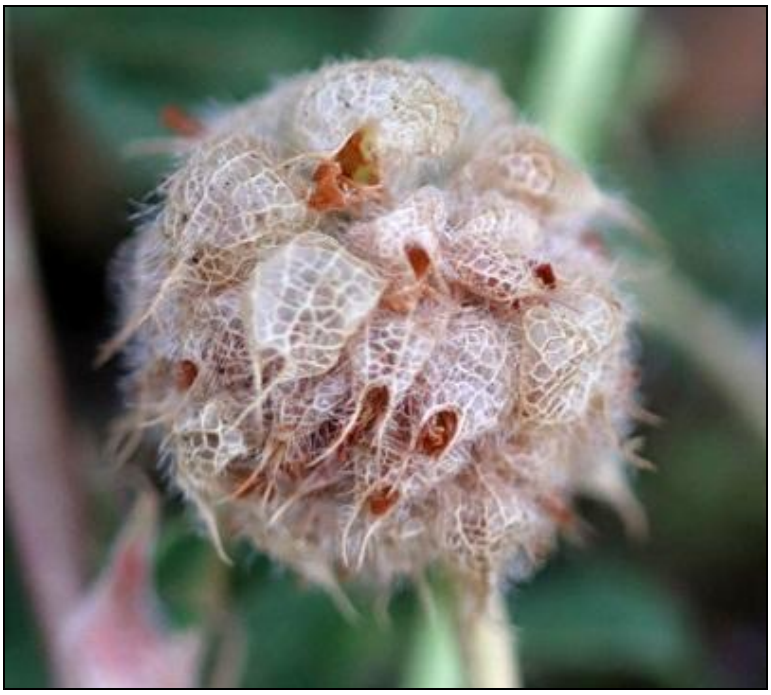
[876] Heinrichs, D.H. (1970). Flooding tolerance of legumes. *Canadian Journal of Plant Science* **50**: 435–438.



Reculver. Photo by David Steere, 9 July 2018

So far as concerns identification, *Trifolium fragiferum* is distinctive in fruit, when the inflated calyces resemble a pink strawberry (*fragiferum* = *fragum ferens* = bearing a strawberry). When not in fruit, it may be noted as the only creeping perennial clover rooting at the nodes, other than *Trifolium repens* (which has leaflets with a V mark and seldom has pink flowers) and *Trifolium occidentale* (Western Clover – not a Kent plant, and never with pink flowers). There are two subspecies, subsp. *fragiferum* and subsp. *bonannii*, the latter being of somewhat doubtful status. It is supposed to have smaller calyces (4-6mm, not 8-10mm, in fruit) and sometimes larger and more elongated inflorescences (which can exceed 22mm). We have no data as regards their respective Kent distribution, other than that material in **CGE** has been identified as subsp. *bonannii* from East Kent (TR13) and in **BM** from West Kent (TQ47).

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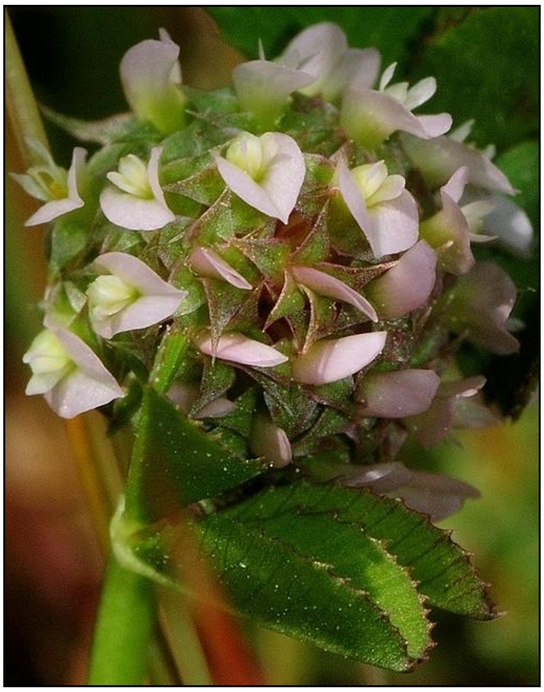
[877] Andersone-Ozola, U., Jēkabone, A., Purmale, L., Romanovs, M. & Ievinsh, G. (2021). Abiotic Stress Tolerance of Coastal Accessions of a Promising Forage Species, *Trifolium fragiferum*. *Plants* **10**:1552

Trifolium glomeratum L. (Clustered Clover)

vc 15 & 16

Rarity / scarcity status

Trifolium glomeratum is a winter annual clover which grows primarily by the coast of southern England and the Channel Islands. It has formerly been treated as nationally scarce, but is no longer so and its conservation threat assessment in both England and Great Britain as a whole is one of 'Least Concern'. That assessment, for England, was based on a comparison of data between the periods 1930-1969 and 1987-1999 which showed a decline of area of occupancy and/or extent of occurrence of less than 30%; if, however, 1987+ data had been taken as a proportion of all data (including re-1930), the decline would have been 36%, which is more concerning. In Kent, Philp (2010) suggests that has been a substantial decline, to the level of scarcity, between the periods 1971-80 and 1991-2006. However, subsequent records are more extensive and the species, although far from common, does not appear to be rare or scarce in the county. Nevertheless, in view of the earlier evidence of decline, it is being maintained on this register for continued observation. It is a Kent axiophyte and so is indicative of good habitat.



Littlestone. Photo by Lliam Rooney, 5 June 2010

Account

The first Kent record is given by Hanbury & Marshall (1899) as by Thomas Willisel, published by John Ray in his *Historia Plantarum* (vol. 1, 1686). However, this was given as 'circa Londinum', and so requires an assumption that it was in Kent and not, for example, on the Thames gravels in Surrey (e.g. at Kew, where there are old records). But it is probably a reasonable assumption: Ray's *Synopsis methodical stirpium britannicarum* (1724 edition, by Dillenius[878]) gave it also by Samuel Doody 'about *Blackheath* and near *Green hithe*'). It is still (2021) present at Blackheath. There are a number of other early records for north west Kent which continue, and the impression given by Philp (2010) that it has vanished from (at least the non-metropolitan part of) north west Kent is misleading. Hanbury &Marshall (1899) treated it as a local native of sandy ground, chiefly near the Thames and on the coast, mentioning it also at Sheppey, between Herne Bay and Whitstable, at Deal/Sandwich, Hothfield, Sandgate, between Dymchurch and Hythe and at Romney Warren.

Francis Rose in his manuscript *Flora of Kent* referred to it as a plant of open sandy and gravelly turf, near the sea and on commons inland; locally common and as frequent in Kent as any county, but very rare over much of Kent; recorded in 11 hectads, with 19 localities 'today' [today = 1960s?]. The inland records which he noted included a gravel pit at Littlebourne, Old Park at Fordwich (1981), gravelly turf at Green Street Green (1944-61), Hothfield Heath (1945) and Ashford Warren (1945), both of these being on the sands of the Folkestone Formation.

Philp (1982) noted it for the period 1971-80 as rare in grassy places on sandy and gravelly soils, with 16 tetrad records; on two occasions it had been found inland as introduced with wool shoddy for agricultural purposes

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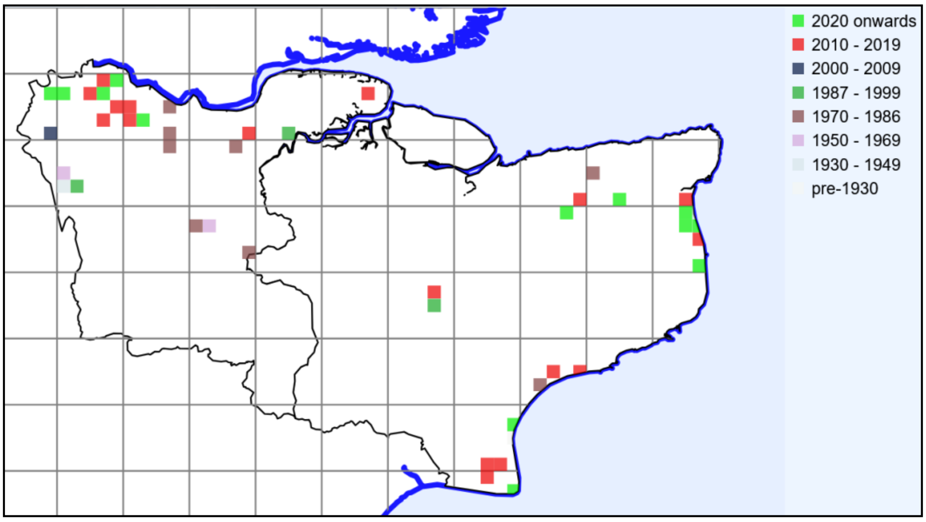
[878] As Hanbury and Marshall (1899) noted, Dillenius had a specimen from Blackheath in his herbarium; but they are probably wrong in stating that there is also one from between Northfleet and Gravesend. G.C. Druce in *The Dillenian Herbaria* (1907) attributed the latter specimen to *Trifolium scabrum*, the first Kent record. The first record for *T. glomeratum* unequivocally assigned to Kent is in Adam Buddle's unpublished manuscript (completed by 1708), as near Woolwich.

(these are probably in TQ65). This total, however, was reduced to eleven tetrads in Philp (2010), covering the period 1991-2005, viz. a couple in north west Kent, a couple in the Ashford area and the rest around Deal/Sandwich. Notwithstanding this, there is not a straightforward issue as regards actual loss, as our 2010-24 records amount to 30 tetrads (39 monads); but ten of these would not have counted towards Philp (2010) anyway, as they are metropolitan West Kent, outside the Kent administrative boundary. However, a total of 20 records during 2010-24 for the area covered by Philp (1982 and 2010) appears to counter the suggestion of material loss if one looks just at tetrad totals.

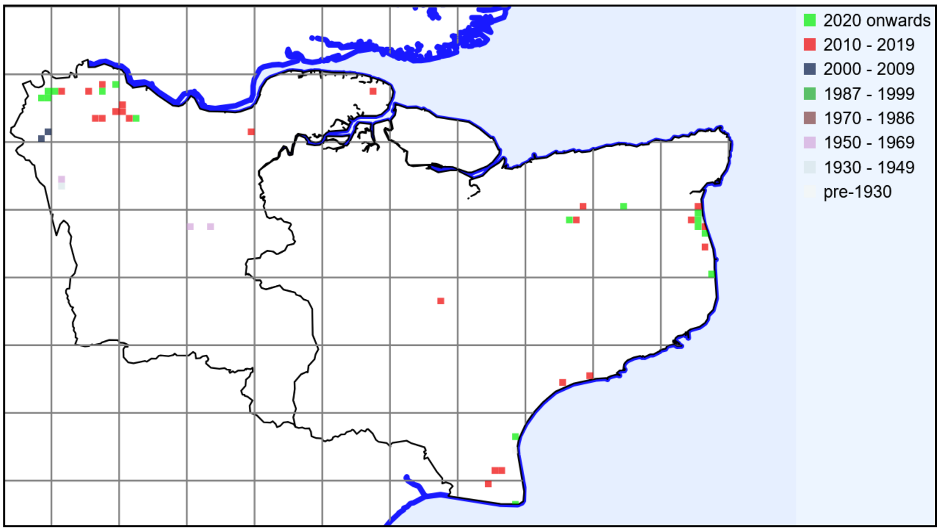
Canterbury. Photo by Lliam Rooney, 24 May 2014

The historical distribution of records is given in the map below at tetrad level, which was the standard recording unit of area from about 1970, and it will be seen that in spite of the position regarding tetrad totals, there are six hectads showing losses before 2000, most of these inland. It may be worth investigating TQ46 for Keston/Holwood, TQ56 for South Darenth; TQ66 for Cobham/ Shorne; TQ77 for Wainscott/Upnor, TR15 for Boyden Gate and Preston but not TQ65 (probably wool alien occurrences unlikely to be still extant).



***Trifolium glomeratum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

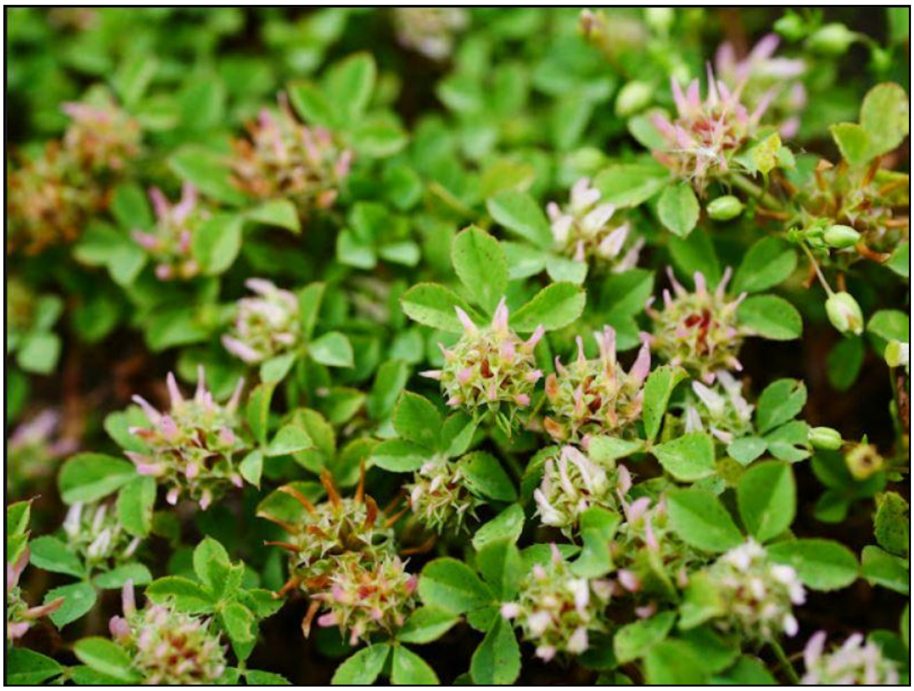
Our rare plant register records for this species are maintained at monad level, and so are four times more sensitive than tetrad recording, which was the norm in Kent up to 2010. The current position is shown below.



***Trifolium glomeratum* Kent records to 2024 mapped at monad level, from BSBI database.**

Trifolium glomeratum is in its English occurrences regarded as a plant of sandy, drought-prone soils generally near the sea, in a variety of open plant communities with associates sharing similar capabilities[879]. In Kent, we have noted it with *Cerastium* spp. (Mouse-ears), *Rumex acetosella* (Sheep's Sorrel), *Trifolium dubium* (Lesser Trefoil), *Trifolium ornithopodioides* (Bird's-foot Clover), *Trifolium scabrum* (Rough Clover), *Trifolium striatum* (Knotted Clover), *Trifolium subterraneum* (Subterranean Clover), *Trifolium suffocatum* (Suffocated Clover), *Trifolium tomentosum* (Woolly Clover)(!), and *Trisetum flavescens* (Yellow Oat-grass). Habitats for recent Kent records have included sandy common land, road verges, a gravel pit, sandy banks and slopes, dune grassland, and sandy coastal golf course land (often where mown). At times its presence has been extensive, e.g. hundreds of plants over a dry, sandy plateau 30m x 30m near Canterbury and thousands on the verge of a golf road at Sandwich. As a winter annual, it germinates in the autumn (earlier in a wet summer) in order to flower next spring. Populations may suffer as a result of spring drought and, indeed, may vary considerably in extent and vigour from year to year.

It may be identified through being a prostrate spreading clover, not rooting at the nodes, with pink flowers in clustered in axillary, unstalked, agglomerate heads, the whole plant, including leaves, being near glabrous.



Blackheath. Photo by
David Steere, 6 June 2021

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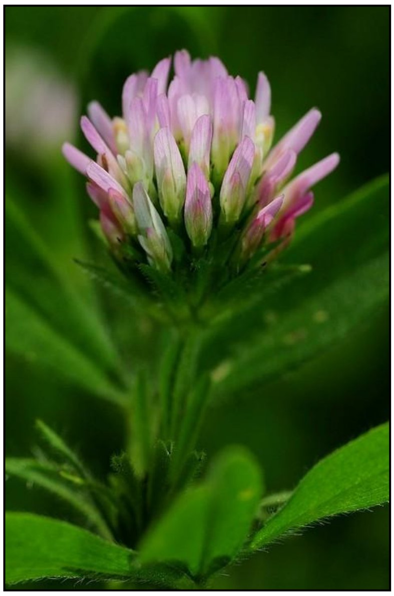
[879] Coombe, D.E. & Leach, S.J. (1994). *Trifolium glomeratum* L. Clustered clover. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough.

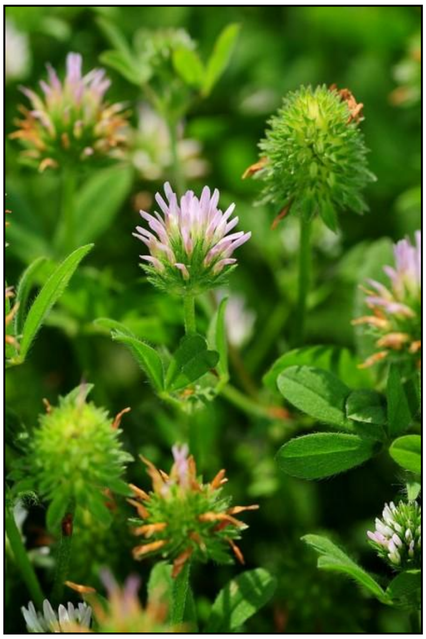
Trifolium squamosum L. (Sea Clover)

vc 15 & 16

Rarity / scarcity status

Trifolium squamosum is an annual clover of saline or brackish estuarial or coastal habitat in south Britain and the Channel Islands. It is **nationally scarce**, although its conservation threat assessment in both England and Great Britain as a whole is one of 'Least Concern'. That assessment, for England, was based on a comparison of data between the periods 1930-1969 and 1987-1999 which showed a decline of area of occupancy and/or extent of occurrence of less than 30%; if, however, 1987+ data had been taken as a proportion of all data (including re-1930), the decline would have been 49%. It is neither rare nor scarce in Kent, although virtually restricted to the north coast, but its Kent populations are significant in a national context. It is a Kent axiophyte and so is indicative of good habitat.





Seasalter. All photos by Lliam Rooney, 13 June 2010

Account

The first Kent record was by Thomas Johnson, who 'first observed it in Dartford salt marish, the tenth of June, 1633', and was able to incorporate this into his edition of Gerard's *Herball* published the same year. It was then new to the British flora: 'for any thing that I know is not figured nor described by any...I have named this *Trifolium stellatum glabrum*, Smooth starrie headed Trefoile'. Later historic records cover the Thames and Medway estuaries and the Kent north coast, from Erith to Reculver. The only out-of-normal-range records appear to be Dillwyn's record (published 1802[880]) as *Trifolium maritimum* 'In Sandwich salt marshes' (reported also by Gerard Smith as 'Marshes near Sandwich' in a manuscript note no later than 1835; by David McClintock in 1937; and by Elizabeth Norman in 1982); Pegwell Bay in 1954 (credited by Francis Rose to 'J.O.', perhaps Mrs Oldaker); and a doubtful record for Folkestone[881]. (A recent Camber record is discussed further below.)

Hanbury & Marshall (1899) described it as a native of 'Banks and marshes, near the sea and tidal rivers; locally plentiful in N. Kent'. After their publication, some odd casual records turned up (from near Wye, 1901, and a brickfield in Wickham Lane, Plumstead, 1907, both specimens in **SLBI**), but there is no obvious cause for their occurrence, unless the latter was an early wool alien. Francis Rose, covering the position up to the 1960s, considered *Trifolium squamosum* to be a plant of dry saltmarshes, sea walls, and grassy banks, on clay or silt soil near the coast and estuaries, being very local and apparently confined now to the North Kent coast. By 1971-80 (covered by Philp, 1982), it was still considered to be frequent in parts of Sheppey and the North Kent coast, although that survey failed to record presence westwards of mid-Hoo peninsula. There was also then an inland sighting of a wool shoddy introduction near Wateringbury. The total of tetrads in which the species was recorded was 30. This compares with 28 in the 1991-2005 survey (Philp, 2010), so there is ostensibly somewhat fuller recording along the north west Kent coast, but overall no significant change. Our 2010-24 records suggest that the north Kent populations are well sustained, if not expanding, albeit within the same area of general distribution, with a total of 39 tetrads (63 monads). There is a possible contraction of range, in that there is no post-2000 record for hectad TQ67, where it was last recorded near Eastcourt Marshes, Gravesend; this would be worth searching for.

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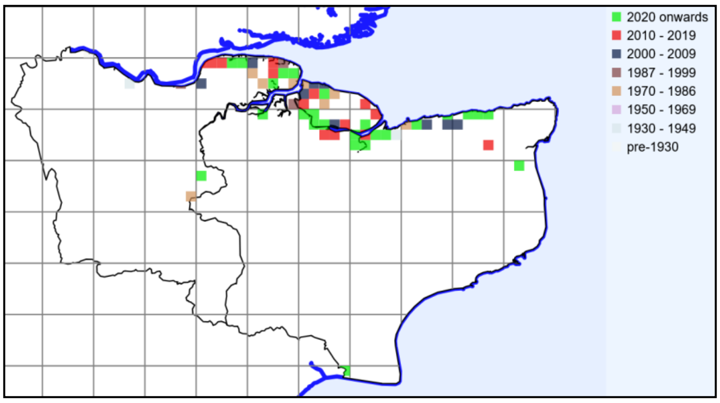
[880] Dillwyn, L.W. (1802. Catalogue of the more rare Plants found in the Environs of Dover, with occasional Remarks. *Transactions of the Linnean Society of London* **6**:177-184.

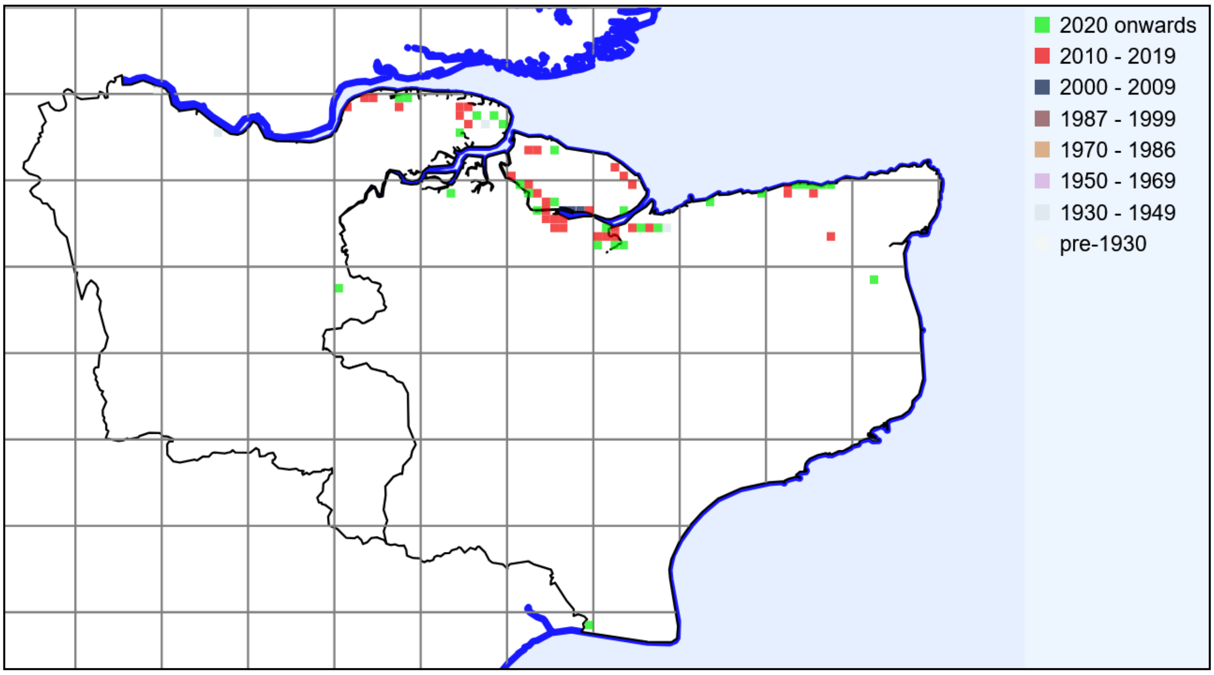
[881] In *The Wild Flowers and Ferns of the District round Folkestone* (1950) compiled by J.W. Walton 'based upon the work of the late Mr. G.C. Walton, F.L.S., as published in 1894'. This was evidently an 1894 list plant and although accepted by Hanbury and Marshall (1899), was apparently rejected by Francis Rose for the purposes of his manuscript *Flora of Kent*.

There is, however, an extension of range as regards East Sussex coast populations which, although concentrated around the Ouse and Cuckmere outlets, have been found to have outliers eastwards, with one having established at Jury's Gap near Camber. This comprised in 2012 at least three vigorous patches on the inland side of a grassy roadside verge with halophytes nearby, and is in the administrative county of East Sussex but for recording purposes lies in East Kent, vice county15. It was still present in 2021, and receives the equivalent of sea spray by adjoining a large puddle, brackish at times due to its proximity to the sea, which is splashed by passing cars. The historical distribution of records is given in the map below at tetrad level, which was the standard recording unit of area from about 1970.



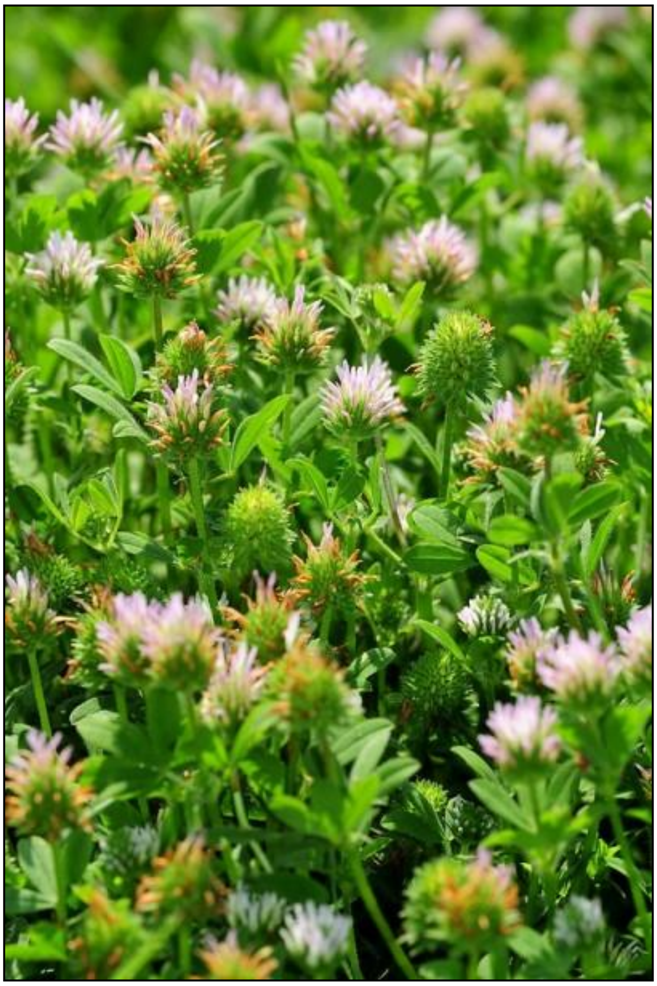
***Trifolium squamosum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

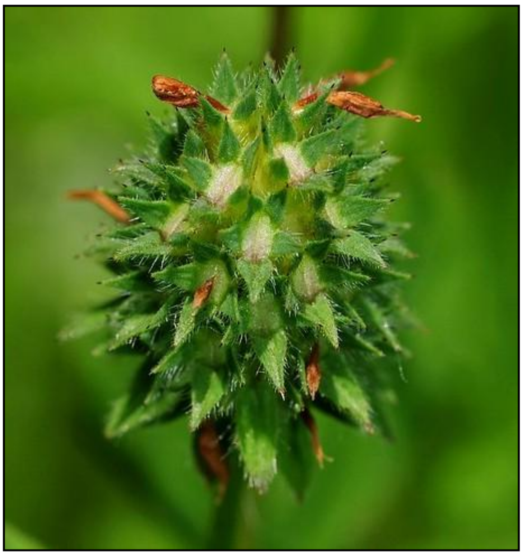
***Trifolium squamosum* Kent records to 2024 mapped at monad level, from BSBI database.**



From 2010, monad level recording became standard and this is how the register data is currently collected, as shown in the accompanying distribution map.

Trifolium squamosum is generally regarded as a usually maritime plant of saltmarsh edges, eroded saltings, sea walls, brackish meadows, tidal rivers and creeks, generally growing on saline clay[882]. It is an annual, tolerant of some competition, but not trampling or grazing, being an upright plant (to 40cm) as distinct from many of our other coastal clovers which are ground-hugging and can accept or escape grazing. Our post-2010 records refer to its presence on the top and sides of grassy sea walls and neighbouring grassland, bare estuarial sand, brackish hollows, alongside a saline lake, towards the bottom of slumping cliffs of London Clay and on dried-out coastal marshland. Associated species noted include *Bupleurum tenuissimum* (Slender Hare's-ear – the grassy ground just landward of sea defence walls is a shared characteristic habitat), *Parapholis strigosa* (Hard-grass), *Sagina maritima* (Sea Pearlwort) and *Trifolium fragiferum* (Strawberry Clover)





It may be identified as an erect, hairy clover, whose oval heads of pink flowers become dominated by the green calyces with their teeth prominent in fruit, so that, although it is said that it is best recorded in May or June when in full flower, the characteristic appearance of the fruiting or decaying heads have enabled us to continue to record into September and October.

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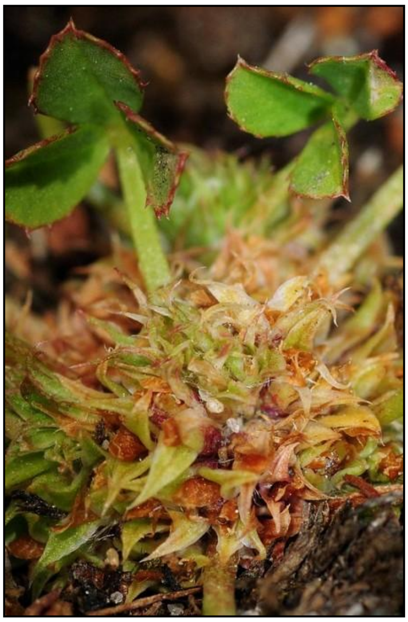
[882] Coombe, D.E. (1994). *Trifolium squamosum* L. Sea clover. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough.

Trifolium suffocatum L. (Suffocated Clover)

vc 15 & 16

Rarity / scarcity status

Trifolium suffocatum is a low-growing winter-annual of dry, often sandy soils of England and Wales, mostly in the south and east. It is **nationally scarce**, although its conservation threat assessment in both England and Great Britain as a whole is one of 'Least Concern'. It is barely present in West Kent, but sufficiently frequent in two coastal parts of East Kent as not to qualify as rare or scarce. It is a Kent axiophyte and so is indicative of good habitat.



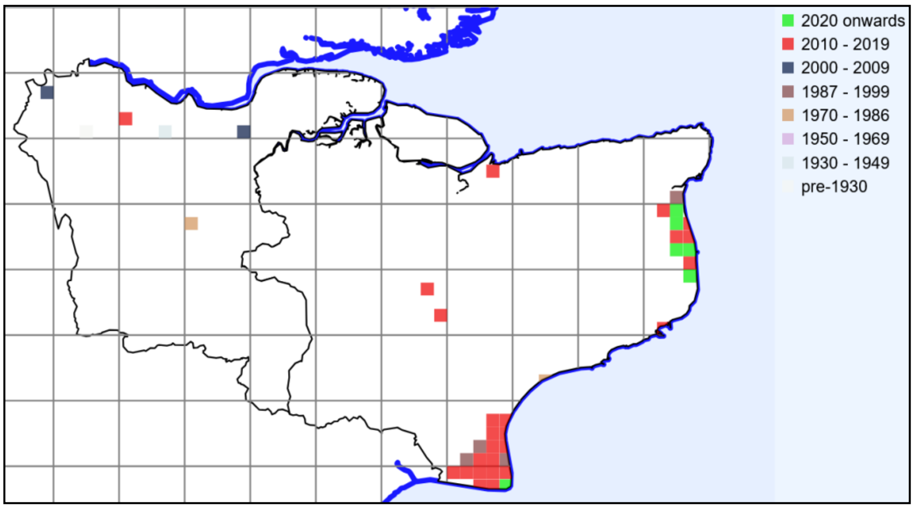
Betteshanger. All photos by Lliam Rooney, 22 May 2012

Account

The first Kent records are by Gerard Smith, given in *A Catalogue of rare or remarkable Phaenogamous Plants, collected in South Kent* (1829). He referred to it 'Upon the sandy-plat near [the Boat-House, Sandgate]...Upon the Warren, New Romney; upon the common at Lydd.' In his manuscript notes of 1830-32 he added 'Between Sandgate & Hythe, to the left, at the road side, a few paces beyond the watercourse which crosses the road, west of the Port-house'. Hanbury and Marshall (1899) considered it to be a rare native of gravelly soil, chiefly near the sea. They noted its presence from Walmer to Sandwich and also in the south-east of the county, both areas where it continues now. In the nineteenth century, there was a scattering from Folkestone to Sandgate to Hythe and Dymchurch, which no longer shows up as records (the last being at the sea wall south of Dymchurch (1946) and a Philp (1982) record from TR13L, the vicinity of Lydd Ranges). Other locations noted by Hanbury & Marshall (1899) were Chislehurst Common; the gravels of Blackheath (gone by 1884); and Upnor. None of these others seem to have survived the nineteenth century, although north-east of Upnor, Francis Rose found it on the Isle of Grain coast in 1945.

Rose described *Trifolium suffocatum* as a native of open ground and turf on neutral sandy and gravelly soils, especially on the coast; rare but locally plentiful, and very tolerant of trampling. The eastern and south-eastern coastal concentrations were known to him, but he also noted sites at Green Street Green (Lane End), 1945-59 (the gravelly ground on which is host to a number of unusual clovers); behind Shorne Windmill, 1945-47 (which may be the same as the TQ67V record in Philp (2010) for sandy heathland at Shorne); and on the ancient sea-cliff at Stone-in-Oxney, 1949. His manuscript *Flora of Kent* contains no record for it later than 1962, and notes that there were 13 modern records.

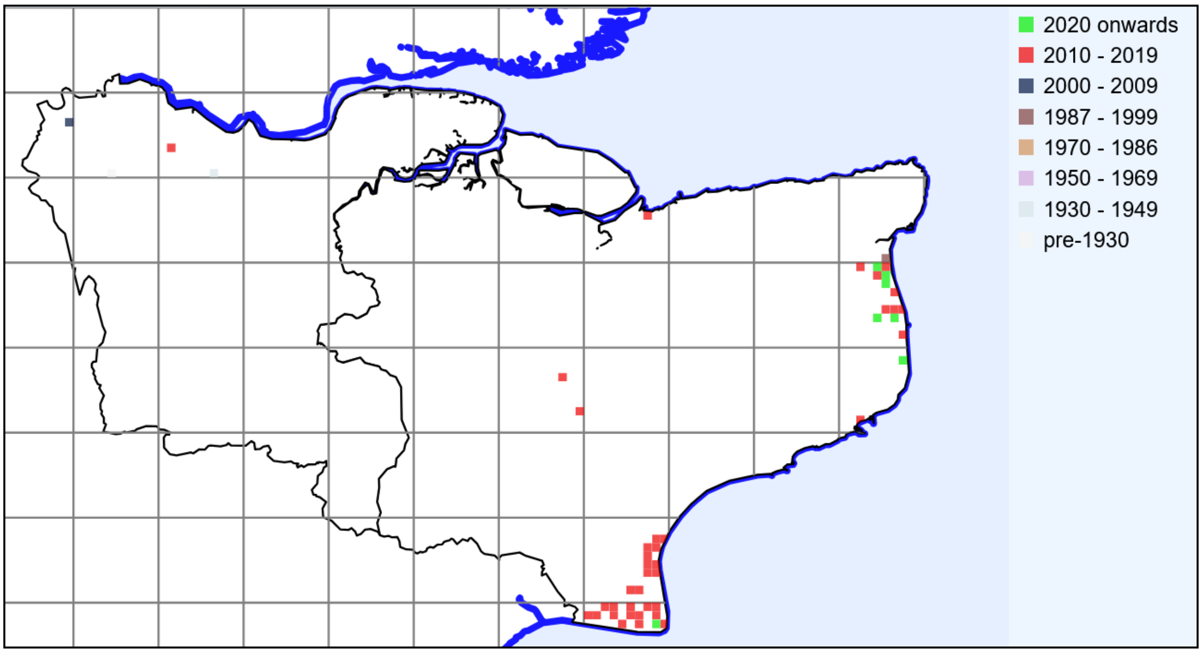
For the period 1971-80, Philp (1982) recorded presence in 17 tetrads, on sandy and gravelly places near the sea, with one inland wool alien sighting, in the Borough Green area (TQ65D). For the 1991-2005 survey (Philp, 2010) 23 tetrad records were made, almost entirely in the core distribution areas of Sandwich to Walmer and Lydd/Dungeness, but including a new inland record for Hothfield (still present 2011).



***Trifolium suffocatum* Kent records to 2024 mapped at tetrad level, from BSBI database.**

So there appear to be no issues as regards decline, and this is backed up by our 2010-24 records for 31 tetrads (equivalent to 45 monads). However, as regards the extent of occurrence at hectad level, we are missing recent sightings in 10km squares TQ36 (Sandwich Bay, last seen 1987, TQ 352 605) and TQ67 (Shorne, last seen 2004) and TQ65 (not expected to be re-found).

Our register data is currently collected at monad level (or finer resolution), and this has been the case since 2010. The results are given in the distribution map below.



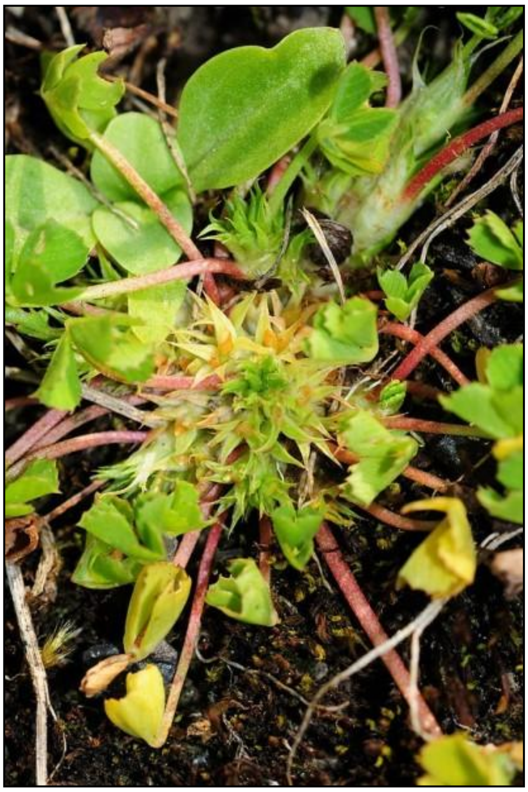
***Trifolium suffocatum* Kent records to 2024 mapped at monad level, from BSBI database.**

Trifolium suffocatum is in south east England a plant of sandy or gravelly ground, including consolidated sand and shingle, which provides openness for annual germination and the absence of competition which is needed. Trampling may assist the poverty of the substrate in keeping open conditions. Our 2010-23 records noted habitats such as bare patches by paths on sandy ground including dune grassland, sea wall tops, the consolidated shingle environs of beach huts, open compacted shingle paths, mown road-verges, a well-watered coastal golf practice range, the edge of an inland football field and, interestingly, bare colliery spoil.

The latter was at Betteshanger (formerly Fowlmead) Country Park, where the extensive spoil is very nutrient-poor, can be both sharp- and poor-draining depending on the level of compaction, and is slow to admit plant colonisation. We have yet to record presence at coastal campsites, but given the frequency with which it has established in such habitats in north western France, Belgium and the Netherlands, this is a possibility. We have not recorded associated species consistently, but these have included *Medicago polymorpha* (Toothed Medick), *Trifolium ornithopodioides* (Bird's-foot Clover) and *Trifolium scabrum* (Rough Clover).

It normally germinates in autumn, but seeds can germinate in wet summers with a second generation of plants flowering in August, the first taking place from March to May after which the plant disintegrates.[883] The latest in the year that we have recorded plants is the end of October.

Trifolium suffocatum is distinctive in flower, when the unstalked axillary heads have a very congested appearance close to the ground, when they may be bent over to show pale bases, but later becoming more globular, with the calyces projecting in a green spiky cluster; the flowers themselves are not prominent, being small, white and short-lived. The leaves are hairless, obcordate and held erect; the leaf veins are somewhat raised from the surface which may help distinguish from *Trifolium ornithopodioides* (Bird's-foot Clover) when vegetative.



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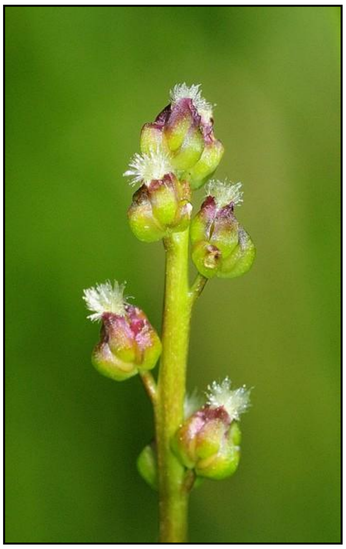
[883] Coombe D.E. (1994). *Trifolium suffocatum* L. Suffocated clover. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC, Peterborough.

Triglochin palustris L. (Marsh Arrowgrass)

vc 15; not seen recently in vc 16

Rarity / scarcity status

Triglochin palustris is a perennial of marshy, sometimes saline places and is widespread in the British Isles, especially the north, but much less common in south east and south west England. Its conservation threat status in Great Britain as a whole is one of 'Least concern', but in England it is regarded as **Near Threatened**. A comparison of English data over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 27% reduction in the likelihood of recording the species. In Kent, there is evidence of decline since the 1970s, with a considerable loss of range; the species is **bordering on scarce** and apparently lost to West Kent. It is a Kent axiophyte and so is indicative of good habitat.



Worth Minnis. Photo by Lliam Rooney, 5 July 2011

Account

The first record of Marsh Arrowgrass for Kent is in Daniel Cooper's *Flora Metropolitana* (1836) as found in marshes between Greenwich and Woolwich. This and other nineteenth century records were given by Hanbury and Marshall (1899), who regarded it as a not uncommon native of swampy places, but apt to escape observation, being a very inconspicuous plant, especially when growing in long herbage. The marshes by the Thames here and further downstream, at Plumstead (where plentiful), Erith, Stone and Dartford, with an outlier near Gravesend, were evidently still a stronghold at the beginning of the twentieth century, but diminished with development and drainage. Nevertheless, it was still present on brackish dike margins at Crayford Marshes in 1990 and 2003, where there is a chance of survival since (although not found on search in 2023).

Faversham. Photo by Stephen Lemon, 11 August 2013

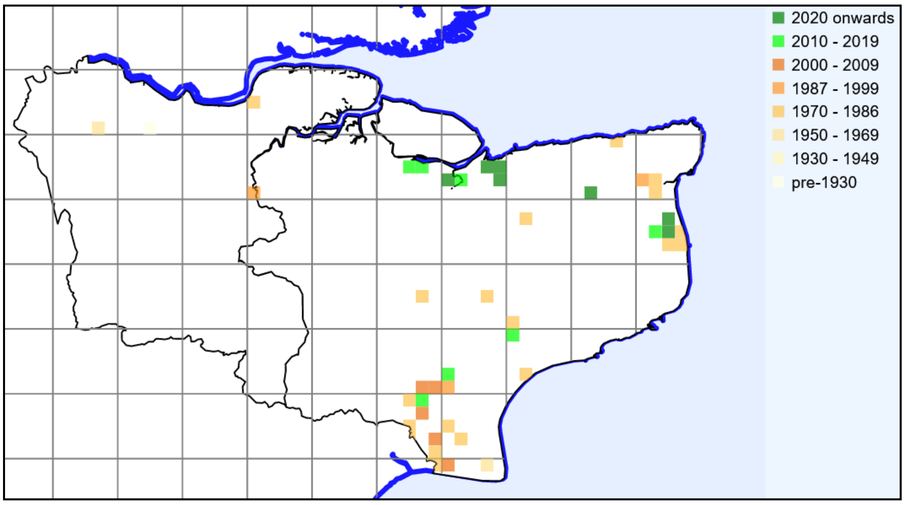
Elsewhere in West Kent, Hanbury & Marshall (1899), so far as concerns localised records, noted only a moor near Greatness, Sevenoaks (this may well have been wet by virtue of the junction of the Folkestone Sand Formation and Gault Clay but the habitat no longer exists); and a wet field between Leybourne and Snodland. The latter is in the Medway catchment and may have had much in common with their East Kent records on the other side of the Medway, near Wouldham and on flat marshy ground by the river between Rochester and Burham. It was present east of Halling at least until 1944 and at Holborough Marshes (where it ought still to be) until 1947 in Francis Rose's records (later, into the 1970s/80s in others'). For the Leybourne area, there is a 1970s record for TQ76A but this tetrad spans the East/West Kent boundary and later records are credited to East Kent, so there is some uncertainty here.

In the rest of East Kent, Hanbury & Marshall (1899) gave a spread of records: swampy ground near Bysing Wood and also Ham Marshes, Faversham; Seasalter; Dungeness; between Hythe and Dymchurch; Romney

Marshes; Sandwich (a pool among the sandhills) ;and several sites relating to the Stour catchment (the 'horse-shoe' bend near Sturry; between Stodmarsh and Grove Ferrry; Minster and Sarre; and the fens at Ham Pools and Preston). Most of these sites are coastal or by tidal rivers, generally with brackish drainage, but there is an alternative habitat, which Francis Rose described as 'calcareous spring-fens and fen-meadows'. This latter habitat is still known to us in the fens at Ham Fen and in the Hacklinge / Worth Minnis area, but there are many sites of this character known to Francis Rose in the 1940s-60s which have gone or have eluded detection since. For example, a damp calcareous site near the River Cray at Foots Cray Meadows (discovered 1955 and surviving at least until 1967); a meadow south of Lullingstone Castle (1956); a fen meadow at Fairbourne Mill, Harrietsham; a calcareous flush in a meadow south west of Hever Church; calcareous fen-meadows at Stowting (1946-54); a calcareous flush at Darnley Vale, Coolinge, Sandgate (1947-55); and a calcareous fen-meadow, The Lince, Etchinghill (1958).

Faversham. Photo by Lliam Rooney, 31 July 2017

The 'losses' (or at any rate, failures to re-find) in the county are substantial, but require analysis. Even as far back as Philp (1982), covering the period 1971-80, it was said that Marsh Arrowgrass was scarce and decreasing through loss of habitat, then present in 19 tetrads. For the period 1991-2005, Philp (2010) recorded only four tetrads, saying that it appeared to have gone from several former localities through drainage, agricultural intensification or development. There were, however, other recorders who were not represented in those results (but whose records reached the BSBI database) and if one takes a slightly wider period, 1987-2009, the species was found in ten tetrads. And subsequently, for 2010-24, it was found in 14 tetrads (18 monads). It would, however, be misleading to conclude that the drop from 19 (in the 1970s) to 14 (from-2010) is of limited significance, being 'only' 26%.



Triglochin palustris **Kent records to 2024 mapped at tetrad level, from BSBI database.**

If one considers the accompanying historical distribution map, it will be seen that over half of recent records represent fairly intensive survey in three hectads south of the Swale, from Conyer to Seasalter. However, the following nine hectads appear to represent losses since 2000, and often from the 1970s/80s: TQ76 (Leybourne / Holborough); TQ77 (Cliffe/Higham Marshes); TQ94 (Hothfield); TR02 (Romney Marsh: Baynham and Midley); TR04 (Brook); TR14 (Stowting); TR15 (Canterbury); and TR36 (Ash Levels, Richborough and Ebbsfleet). With only seven hectads showing presence since 2010, the data indicate a major contraction of range. This is greater than indicated, as the map is based on BSBI data, and there are two other 'lost' hectads deriving from other data sources, whose records are given in the table below (TQ44 Hever and TR25 Wingham).

Triglochin palustris features in ditch surveys which have been undertaken for Natural England and its predecessors, including the 1993-94 Walland Marsh survey[884](for the Dowels, Snargate, Fairfield, Woolpack and, lying partly in Sussex, East Guldeford) in which *Triglochin palustris* was found to be infrequent overall (and some of its records were not necessarily Kentish), but it was a key bank species in characterising good or exceptionally species-rich fresh and brackish ditches. It appeared to benefit from the sward structure produced by grazing and was noted at the Dowells, where not seen before (in 1980 it was at Fairfield). Our 2020-23 records frequently note it in marginal contexts of grazed areas, generally grazed by cattle but at Romney Marsh by sheep. The latter were capable of producing poached ditch margins, perhaps less so than cattle, but more tight-cropping.

Sites include grazing marshes, cattle-trampled mud by ditches, wet edges of trampled dike margins, old wet dune slacks, bog (at Hothfield, acid with some base-rich influence), marshy sedge-rich fen pasture at Ham valley (Francis Rose referred to this species in Kent a usually in short vegetation of *Parvocaricetum* type). Although it is readily grazed, it is capable, when damaged, of producing hydrocyanic acid which may induce cattle poisoning, but as it is a slender plant and does not occur in great quantity with us, poisoning does not appear to be a UK issue and in any event *Triglochin maritima* (Sea Arrowgrass) would be more of a risk.

Seasalter, in seed. Photo by Lliam Rooney, 2 August 2012

Associated plants noted include *Phragmites australis* (Common Reed) in a dike context; and *Dactylorhiza praetermissa* (Southern Marsh-orchid), *Epipactis palustris* (Marsh Helleborine) and *Hydrocotyle vulgaris* (Marsh Pennywort) in a wet dune context. *Triglochin palustris* is wind-pollinated. The potential seed production per plant has been estimated at c. 400[885], considerably less than *Triglochin maritima*, at c. 9,000, which may go some way towards explaining their difference in seed and wind production.

Both species can overlap in habitat in less saline grassy saltmarsh, where *Triglochin maritima* may extend from its usually more saline niche, but we have not observed overlap in Kent. *Triglochin palustris* has, however, been noted by Faversham Creek by the edge of a large dike running parallel to the sea defence wall on the landward side, whereas *Triglochin maritima* grew on the tidal creek side of the wall. The two species are readily distinguished by *Triglochin maritima* being more stout, vigorous and fleshy with a denser raceme; its leaves are usually flat on the upper side near the base (those of *T. palustris* are deeply furrowed); the ligule of *T. palustris* is blunter and wider than long (those of *T. maritima* are pointed and are longer than wide).

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[884] Williams, R., Banks, B., Cameron, R. & Cooke, R. (2000). *Ditch monitoring at Walland Marsh SSSI 1993/4*. English Nature Research Report No.132.

[885] Looman, J. (1976). Biological Flora of the Canadian Prairie Provinces IV. *Triglochin* L., the genus. *Canadian Journal of Plant Science* **56**: 725-732.

Brown font in table below indicates records for hectads where seen since 1970 but not in recent years.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Hever	TQ4744	Local Wildlife Site	26 July 1984	JP	Hever Pasture, TQ 474 447 [this is a generic grid reference for the site, which was designated a SNCI with a description referring to the species as being present in the more open areas; a more recent citation indicates that the species could not subsequently be found.]
Crayford Marshes	TQ5377		July 2003	MS	TQ 535 777 and TQ 534 776, with *Butomus umbellatus*. [Neither found along this ditch, July 2023, GK; water is polluted but one margin is horse-grazed, seemingly having suitable habitat.]
Leybourne	TQ76A		(1) 1991-99 (2) After 1970, before 1981	(1) EGP (2) Philp (1982)	
Holborough Marshes	TQ7062	SSSI, KWT reserve	(1) 1989 (2) 1978	(1) DPe & MP (2) GS & JP	(1) [TQ 706 622 – may be a generic grid reference for the entrance gate.]. (2) TQ 7094 6265.
Cliffe / Higham Marshes	TQ77C		After 1970, before 1981	GS, JRP, MHD, EGP, in Philp (1982)	
Camber	TQ91U		After 1970, before 1981	Philp (1982)	Only a small part of this tetrad is in vc15. There is also a vc14 record which may fall within the same date span.
Jury's Gap	TQ91Z		After 1970, before 1981	Philp (1982)	
Guldeford Lane Corner, Romney Marsh	TQ92L		After 1970, before 1981	Philp (1982)	
SW of Fairfield	TQ92M		After 1970, before 1981	Philp (1982)	
Appledore	TQ92P		After 1970, before 1981	Philp (1982)	
Fairfield	TQ92S	SSSI	(1) 1983, 1984 (2) 1981, 1982, 1984, 1986	(1) & (2) JOM	(1) TQ 969 268, Fairfield Brack (1983), branch of ditto (1984). Romney Marsh Ditch Plants Survey. (2) TQ 965 264, shallow dike, Romney Marsh Ditch Plants Survey.
N of Fairfield	TQ92T	SSSI	(1) 11 September 2008 (2) 8 July 2003 (3) After 1970, before 1981	(1) NFS (2) EGP (3) Philp (1982)	(1) TQ 9712 2731, Fairfield Level.
North of Camber	TQ92V		After 1970, before 1981	Philp (1982)	
Walland Marsh	TQ92W	SSSI	12 September 2008	NFS	TQ 9827 2395 and TQ 9846 2384. Buglife grazing marsh ditch survey.
Appledore east	TQ9629	SSSI	16 July 2015	KBRG meeting	Numerous small patches of plants on north bank of Engine Sewer from TQ 96565 29808 to TQ 9669 2982
Conyer Creek	TQ9565	SSSI	13 August 2012	SB	TQ 95753 65031, many plants covering 1 x 2m at muddy margin of dike.
Hothfield	TQ94S		After 1970, before 1976	Philp (1982)	TQ94S.
The Dowels	TQ9730, TQ9830	SSSI	(1) 12 September 2008 (2) 10 September 2008	(1) & (2) NFS	(1) TQ 9717 3032, TQ 9791 3025. Buglife grazing marsh ditch survey (2) TQ 9815 3023. Buglife grazing marsh ditch survey.

Teynham Levels	TQ9665	SSSI	1 August 1997	RM[886]*	TQ 968 650.
Teynham Levels	TQ9764	SSSI	(1) 16 July 2016 (2) 1 August 1997	(1) LM & AW (2) RM*	(1) TQ9764 (2) TQ 974 642, TQ 975 642, TQ 975 646, TQ 975 648, TQ 970 648, TQ 972 646,. TQ 972 647.
Teynham Levels	TQ9765	SSSI	1 August 1997	RM*	TQ 972 652, TQ 970 651.
Teynham Levels	TQ9863	SSSI	1 August 1997	RM*	TQ 987 637.
Teynham Levels	TQ9865	SSSI	1 August 1997	RM*	TQ 980 650.
E of Teynham Levels	TQ9963	SSSI	1 August 1997	RM*	TQ 992 637, TQ 990 634, TQ 990 635.
E of Teynham Levels	TQ9964	SSSI	1 August 1997	RM*	TQ 991 640.
Jury' s Gut Sewer	TR0019		22 June 2006	RS	TR 0049 1904, edge of lake.
Baynham, Romney Marsh	TR0024		(1) 1984, 1983 (2) 1983	(1) & (2) JOM	(1) TR 004 240, Baynham E dike. Romney Marsh Ditch Plants Survey. (2) TR 005 242, Baynham NE dike.
Oare	TR0062	SSSI	(1) m 12 June 2023 (2) 9 July 2022 (3) 14 July 2017 (4) 30 July 1985	(1) AL & IW (2) AL (3) DC (4) JP	(1) TR 006 627. Abundant along the stream. (2) TR 006 627, Oare Meadow. (3) TR 00632 62759. (4) TR 007 627.
Hamstreet south east	TR0132		24 August 2014	KFC meeting	A line of plants along a ditch margin where sheep poach at TR 0168 3223 for 3 or 4m and probably considerably more. Plants heavily grazed by sheep, just 3 or 4 flower spikes.
Oare Creek	TR0163		18 October 2019	LR & CW	On the east side of Faversham Creek.
Faversham Creek south	TR0262	SSSI	(1) 27 July2017 (2) 11 August 2013	(1) LR (2) SL (KFC meeting)	(1) 11 plants at the end of an east-west ditch at TR 02975 62840 and about 30 plants along the same ditch from TR 02967 62836 to TR 02845 62822, with 4 plants found on the opposite side and 6 plants at TR 02979 62812. (2) One flowering plant TR 02753 62554 and three flowering plants TR 02979 62812, along marshy / grazed *Phragmites*-lined edge of large dyke running parallel to sea wall..
Midley, Romney Marsh	TR0323		1981	JOM	TR 035 230, E of church. Romney Marsh Ditch Plants Survey
Snave, Romney Marsh	TR03A		1 October 1988	EGP	TR03A.
Brook	TR04S		After 1970, before 1981	Philp (1982)	TR04S.
South Swale	TR0464	SSSI	6 August 2011	RM	TR 045 649.
Seasalter Levels	TR0764	SSSI, RSPB reserve	(1) 5 August 2022 (2) 13 June 2013	(1) AL (2) LR, GK & FRG	(1) TR 0788 6428. (2) Wet edge of cattle-trampled dyke margin vegetation.
Seasalter Levels	TR0863	SSSI, RSPB reserve	(1) 28 May 2022 (2) August 2013 (3) 20 July 2013 (4) 2 August 2012	(1) AL (2) BB (3) KFC meeting (4) SB & LR	(1) TR 0810 6399. Seasalter Level. (2 (a) TR 08115 63821, frequent on cattle-trampled mud by ditches. (b) TR 08075 64045, rare on cattle-trampled mud by ditches. (3) Ditch at TR 08128 63847. (4) TR08115 63821, frequent on cattle-trampled mud by ditches.
Seasalter Levels	TR0864	SSSI, RSPB reserve	(1) 05 August 2022 (2) 28 May 2022 (3) 21 May 2022 (4) August 2013 (5) 2 August 2012	(1) AL (2) AL (3) AL (4) BB (5) SB & LR	(1) TR 0825 6424. A good patch. (2) TR 0807 6405. (3) TR 0845 6425, several patches along this cattle-grazed bank of the ditch. TR 0841 6425, ditch margin. (4) TR 08075 64045, rare on cattle-

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[886] This, and subsequent RM records marked with an asterisk, were recorded on the basis of identifying plants in a 50m stretch of watercourse - 25m being each side of its intersection with a 100m OS gridline

					trampled mud by ditches. (5) TR 08095 64130, more than 100 plants at margin of c. 100m stretch of dike
Gibbins Brook	TR1138	SSSI	30 June 2013	KBRG meeting	Northern bog, a couple of spikes.
Palmarsh	TR13G		After 1970, before 1981	Philp (1982)	TR13G.
Swalecliffe	TR1367	SSSI	November 1980	HW	The Brook, TR 1363 6750.
Brabourne	TR14A		After 1970, before 1981	Philp (1982)	TR14A.
Milton Bridge - Harbledown	TR15I		After 1970, before 1981	JK & EGP (Philp, 1982)	TR15I.
Stodmarsh north east)	TR2261	SSSI, national nature reserve	(1) 5 July 2022 (2) 1 July 2022	(1) AL, HS & KC (2) AL & KC	(1) TR 2295 6199. Ditch with grazed margin, ditch survey. (2) ditch survey, a few plants at TR 2292 6196; and a few at TR 2289 6197.
Wingham	TR2457		30 September 1992	CD	TR 2472 5757.
E of Birchington	TR26U		After 1970, before 1981	Philp (1982)	TR26U.
E of Hacklinge	TR3354	KWT reserve, SSSI	(1) 17 June 2018 (2) 1 August 2012 (3) 1982	(1) SL (2) SB & LR (3)ACH	(1) Hacklinge, west side of A258 Ham Fen KWT): (a) cattle-grazed pasture and ditches (Unit 56), northern end, TR 33864 54597. Only two spikes found. (b) South Stream, damp field edge along northern side (Unit 53: Ham Fen Fields), TR 33747 54593. Abundant. (c) Flooded ditch, cattle-poached edge along both sides (Unit 53: Ham Fen Fields), TR 33846 54488 to TR 3376 5442. Abundant. (2) On wet peat, Ham Fen Reserve, TR 3338 5489. (3) TR3554.
Hacklinge / Worth	TR3355	KWT reserve, SSSI	19 July 2017	SB & SL	Ham Fen. Frequent throughout a wet peaty mire centred on TR 331 552.
NE of Northborne	TR3453	SSSI	(1) 2 March 1983 (2)1982	(1) ACH (2) ACH	(1) TR 344 535, Sandwich & Pegwell Bay survey. (2) TR3453.
Hacklinge, Lydden Valley	TR35M, includes TR3454, TR3455, TR3554, TR3555	SSSI, includes RSPB reserve	(1) 5 August 2021 (2) 22 June 2021 (3) 10 July 2020 (4) 13 August 2016 (5) 5 September 2013 (6) 5 July 2011 (7) 1991-99 (8) 1982 (9) After 1970, before 1981	(1) SB (2) SB & SL (3) SB (4) SL (5) LR, GK & FRG (6) KBRG meeting (7) EGP (8) ACH (9) Philp (1982)	(1) TQ3455. (2) Lydden Valley, Worth Minnis RSPB, small field along the edge of the public footpath, TR 3421 5577. A small patch of flowering shoots along the edge of the large scrape dug in 2019 / 2020. (3) One plant seen at TR 34296 55741. (4) Cattle-grazed marshy sedge-rich fen pasture in Ham valley, on west side of A258 south of Hacklinge Farm (Unit 56 within Hacklinge Marshes SSSI). Area south of the dividing dyke, TR 340 542 / TR 341 542 / TR 340 541 / TR 341 541. Widespread flower spikes. (5) 2 plants at cattle-trampled ditch margin in pasture, TR 3429 5575. (6) TR 34253 55806, muddy margin of ditch in grazing meadow. (7) TQ35M. (8) TQ3454, TQ3455, TQ3554, TQ3555. (9) TQ35M.
Worth Minnis	TR3456	SSSI, RSPB reserve	(1) 12 August 2023 (2) 2 March 1983	(1) KFC meeting (2) ACH	(1) RSPB Lydden Valley, one plant seen at TR34112 56012 (also

					recorded as TR 34114 56013), compartment 44, field on the west side of Great Wood, edge of water-filled scrape. (2) TR 343 560. Sandwich & Pegwell Bay survey.
Sandwich Bay estate west	TR3557	SSSI	(1) 19 June 2020 (2) 24 June 2014	(1) SB (2) SB	(1) TR 3567 5791 in a wet hollow with *Dactylorhiza praetermissa*, *Hydrocotyle vulgaris* and *Epipactis palustris.* (2) 15-20 plants at TR 35798 57509 with *Hydrocotyle vulgaris*, *Dactylorhiza praetermissa* etc. in old wet dune slack opposite Bird Observatory.
NW of Deal	TR3653		1982	ACH	
Deal, Sandhills	TR3654		1982	ACH	
E of Lydden Valley	TR3655	SSSI	(1)2 March 1983 (2) 1982	(1) ACH (2) ACH	(1) TR 362 555, Sandwich & Pegwell Bay survey. (2) TQ3655.
Deal, near Tenant Hills	TR3754		1982	ACH	
Minster Marshes / Ash Levels	TR36B, includes TR3062		(1) 14 September 1997 (2) After 1970, before 1981	(1) NFS ( ) Philp (1982)	(1) TR3062, Ash Levels N of Lower Goldstone. (2) TR36B.
Richborough / Ebbsfleet	TR36F		After 1970, before 1981	Philp (1982)	TR36F
Ebbsfleet	TR36G		After 1970, before 1981	Philp (1982)	TR36G

Kent Rare Plant Register
Species accounts Part U & V

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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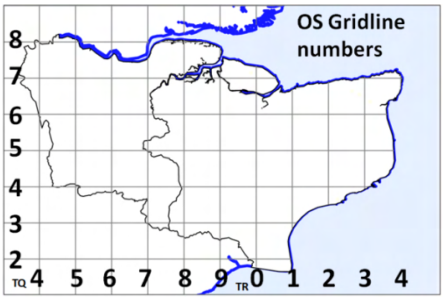
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AL Alex Lockton
ACH Andrew Henderson
AN A.E. Newton
AW Tony Witts
BB Brian Banks
BH B Harrop
BHa B. Hadfield
BW Brian Woodhams
CAS Clive Stace
CBA Chris Blandford Associates
CC Chris Cook
CD Chris Dyson
CEC Carter Ecological Consultants
CO Colin Osborne
CP Chris Preston
DC Danny Chesterman
DCa David Carder
DG Doug Grant
DH D. Hicklenton
DM Daphne Mills
DS David Steere
DSt David Streeter
DW David Walker
EGP Eric Philp
FB Fred Booth
FJR Fred Rumsey
FR Francis Rose
GK Geoffrey Kitchener
GL Graham Lea
HBG Hastings Botany Group
IB Ishpi Blatchley
IH Ian Hadingham
IJ Ian Johnson
JA Jan Armishaw
JB John Badmin
JC James Cadbury
JH Jan Hendey
JJ Judy John
JM Joumana Mobarak
JP Joyce Pitt
JRP John Palmer
JTM Jacques Turner-Moss
JW Jo Weightman
KBRG Kent Botanical Recording Group
KF K. Fox
KFC Kent Field Club
KO Ken Obbard
LR Lliam Rooney
MAS Mark Spencer
MR Mike Robinson
OL Owen Leyshon
PG Phil Green
PHa Peter Harvey
PH Peter Heathcote
PW Phil Williams
RAC Ray Clarke
RM Richard Moyse
RMB Rodney Burton
RCS R.C. Stern
RS R. Souter
SB Sue Buckingham
SC Sue Cambray
SP Sue Poyser
SPi Susan Pittman
SPr Sylvia Priestley
TI Tim Inskipp
WW W. Wadsworth

Other abbreviations and references:

BM = Natural History Museum herbarium	KWT = Kent Wildlife Trust	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G. Philp
BSBI = Botanical Society of Britain & Ireland	MOD = Ministry of Defence	SLBI = South London Botanical Institute herbarium
Hanbury & Marshall (1899) refers to their *Flora of Kent*	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G. Philp	

Ulex gallii Planch. (Western Gorse)

vc 15; gone from vc16

Rarity / scarcity status

Ulex gallii is primarily a plant of heathland and sandy or peaty soils in the western half of the British Isles (i.e. west of a line between Dorsest and the head of the Humber estuary), scattered and much less frequent in east England. Its threat status for conservation purposes is one of 'Least Concern'. It is absent from West Kent and **scarce** in East Kent. It is a Kent axiophyte and so is indicative of good habitat.

Clowes Wood. Photo by Sue Buckingham, 29 September 2012

Account

The first published record for Kent (without further detail) is said by Hanbury & Marshall (1899) to have been given by J.T. Boswell, editor of the third edition of English Botany (vol. 3, 1876[887]), and it was reported by F.M. Webb in 1874 or 1875 from Hothfield Heath. Hanbury and Marshall discounted both these records, having searched at Hothfield and supposing that the report from there was probably a mistake for a strong-growing *Ulex minor* (Dwarf Gorse). However, although the view that it was not at Hothfield obtained for a long time, it was credited by Eric Philp as being present (Philp, 1975)[888] in the form of two bushes above the main bog (now one, 2020), and Marshall eventually accepted it as a Kentish plant, having received specimens from C. G. Matthew collected from the edge of a copse on a hill-side near St. Radigund's Abbey, Dover (Marshall, 1918[889]).

Stelling Minnis, Photo by Sue Buckingham, 2011

There have never been many sightings of this plant in Kent. Francis Rose assembled records for his manuscript *Flora of Kent*. He considered the species to be a very rare native of grass-heath on loam, occurring in two places on superficial drifts (perhaps Pliocene) on the East Kent Chalk plateau, one on drift over Weald Clay, and on a new railway bank in West Kent. The railway bank was east of Kemsing and presumably seed came in with ballast from western Britain; it was probably casual, not seen after 1955. The site on drift over Weald Clay was Aldington Frith, where abundant in 1950. As regards the two sites on drift over chalk (itself presumably under clay-with-flints, so that the chalk does not modify the acidity of the habitat), Francis Rose listed sites at Clowes Wood (which is on London Clay), grass-heath at Stelling Minnis, and a bank at Paddlesworth as well as Marshall's original record, so presumably these last three sites cover the two said to have been on drift over chalk.

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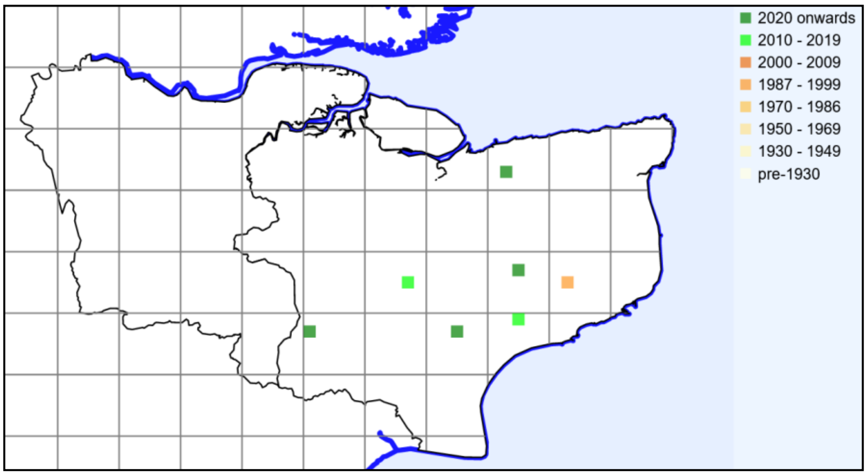
[887] It is, however, not clear that this is the case. *Ulex gallii* was then treated as coming under *Ulex nanus* (minor), and the distribution as including Kent seems to be intended for true *Ulex minor*.

[888] Philp, E.G. (1975). The Biology of the Reserve. *Transactions of the Kent Field Club* **5**: 108-121.

[889] Marshall, E.S. (1918). ULEX GALLII Planchon IN KENT. *Journal of Botany* **56**: 91.

Philp (1982) described *Ulex gallii* as a native plant of rather acid heathland, very local and rare in this part of the country and with only three tetrad records (the Aldington Frith, Clowes Wood and Stelling Minnis sites). Philp (2010), however, was able to add three more sites: at Causton Wood, Hothfield Common and near Swingfield Minnis. It is puzzling that the Hothfield site did not feature in Philp (1982), as Eric Philp knew about it during the survey period; the Causton Wood record has some odd aspects (see data table below); but as regards Swingfield Minnis, there is no reason to suppose that *Ulex gallii* had not been there all the time, simply overlooked, as can readily be done. Our 2010-24 records have continued at or near all these localities except for that in the vicinity of Swingfield Minnis, which has not yet been re-found, but a new one has been discovered at the top of the chalk escarpment near Etchinghill (so that any clay-with-flints or Tertiary drift providing an acid substrate is likely to be thin). Accordingly, there does not appear to have been any general decline in Kent, but it remains very local indeed, and then only in East Kent.

Ulex gallii Kent records to 2024 mapped at tetrad level, from BSBI database.



Etchinghill, habitat. Photo by Sue Buckingham, 11 November 2012

The quantity of Western Gorse at these localities is variable: only one bush at Hothfield and four at Hemsted Forest (part of the same wood complex which includes Causton Wood). On the other hand, the Clowes Wood population is spread over three monads and in 2012 some 200 plants of mixed age were seen in a 600m stretch of cleared open heath plus scattered outliers and a group of a dozen plants in a cleared area in an adjoining monad. At Stelling Minnis Common in 2011 counts of 20 and 60 bushes respectively were made on each side of Bossingham Road. It is noticeable that some of our records relate to land which has been subject to disturbance, generally clearance of tree growth, and this presumably enables germination from any seed-bank (there is evidence of 37.5% of seed retaining viability a year after production)[890]; fire would also encourage germination.

Ulex gallii is moderately shade-tolerant and so can maintain itself as part of the sub-shrub canopy, but our records generally relate to bushes in fairly open land (or if wooded, then not closed-canopy). Some of that land has a history of openness through grazing. At Stelling Minnis Common, the present occurrence of the species should be viewed in the context of this being one of the last remaining manorial commons in Kent, privately owned, but with continuity from its use as ancient common pasture land (indicated by the likely derivation of 'minnis' from the Anglo-Saxon *gemaennes*)[891]. At Aldington Frith, our 2012 recording was in pasture whose historical context was described by Hasted (1799)[892] as 'once a chace, for deer and wild beasts, belonging to the archbishop's manor of Aldington, where they ranged at large as in a forest [this sounds like wood-pasture]...now a large heath, of very uneven surface, about two miles in length, and near as wide'. *Ulex gallii* is susceptible to grazing, but only young shoots.

Clowes Wood, habitat. Photo by Sue Buckingham, 29 September 2012

While *Ulex gallii* is primarily a western species in the British Isles, complementing the largely eastern distribution of *Ulex minor* (the former perhaps preferring wetter conditions and a cooler mid-summer maximum), the position in Kent is reversed, with *U. gallii* being confined to East Kent and *U. minor* being mostly a West Kent plant. Elsewhere, where distribution overlaps (such as Dorset) it appears that the two species seldom co-exist at the most local level and that physical factors other than climate may dictate their separation.[893] There appears to be some correlation, at least in southern England with soil pH, *U. gallii* being able to grow on soils less acid than those favoured by *U. minor*.[894] This may be reflected in the Kentish presence of *U. gallii* on superficial drift soils, not necessarily as base-poor as where the underlying geology is itself acid and influences the growing medium.

Our only records of both species growing at the same site are for Hemsted Forest and Hothfield. *Ulex europaeus* (Gorse) was also present and has been recorded at other sites with *U. gallii.* Other *U. gallii* immediate associates have not been noted, except for *Calluna vulgaris* (Heather) at Hemsted Forest.

As regards identification, out of the three British species of *Ulex*, *U. europaeus* is the commonest in Kent and is generally larger, both as a shrub and in its parts. Its spines are deeply grooved (moderately or weakly in the other species) and the bracteoles, at the base of the calyx, are larger, 1.8-4.5mm long x 1.5-4mm wide (the other are generally less than 1.5mm x 1mm). *Ulex minor* is a much smaller shrub, with lemon yellow flowers, and *Ulex gallii* is somewhat intermediate, with golden flowers. Further differentiation between *U. minor* and *U. gallii* is undertaken by measurements, e.g. calyx length (for *U. minor* (5)6.5-9.5(10.5)mm; for *U. gallii* (8.5)9-13(15)mm) and standard length (for *U. minor* (6)7-12(13)mm; for *U. gallii* (10.5)13-18(22)mm). There is a degree of overlap and single measurements are likely to carry a risk of 5-10% misidentifications, so averaging ten measurements is recommended.

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[890] Bullock, J.M., Edwards, R.J., Carey, P.D. & Rose, R.J. (2000). Geographic separation of two *Ulex species at three spatial scales: does competition limit species' ranges? Ecography* **23**: 257–271.

[891] It may be no coincidence that *Ulex gallii* has been recorded for Swingfield Minnis, although the common was almost entirely enclosed during the 19th century, and the same level of continuity does not exist here.

[892] Hasted, E. (1799). *The History and Topographical Survey of the County of Kent*, vol. 8. Canterbury.

[893] Stokes, K.E., Bullock, J.M. & Watkinson, A.R. (2003). *Ulex gallii* Planch. and *Ulex minor* Roth; (Biological Flora of the British Isles). *Journal of Ecology* **91**: 1106-1124.

[894] 894 Stokes, K.E. et al. (2003), as above.

Stelling Minnis, Photo by Sue Buckingham, 2011

Site	Grid reference	Site status	Last record date	Recorder	Comments
Hemsted Forest	TQ8136	Access land	24 August 2021	SB	Four young flowering plants within a 10m stretch of mostly bare soil at TQ 8188 3614 on the edge of an area which had been disturbed and cleared of vegetation probably within a couple of years and now being colonised by *Ulex europaeus* and *Calluna*. *Ulex minor* flowering in the vicinity allowed for comparison of flower colour as well as calyx measurement comparison.
[Hemsted Forest, Causton Wood]	TQ83I		1991-2005	EGP (Philp (2010)	[Philp (2010) gives this for Causton Wood, TQ83I, in the text, but his recording card has only *Ulex minor* (not included in the Atlas map for that species).]
Hothfield	TQ94S, includes TQ9645	SSSI, KWT reserve	(1) 10 November 2020 (2) 17 September 2018 (3) 27 October 2005	(1) AL & JM (2) AW (3) EGP & DG	(1) TQ 9670 4571. One shrub on the main slope near bog 2, with both other species nearby. (2) TQ9645. (3) TQ94S.
Aldington Frith	TR03N, includes TR0436, TR0536		(1) 7 June 2022 (2) 30 October 2012 (3) 1991-99 (4) After 1970, before 1981	(1) & (2) SB (3) EGP (Philp, 2010) (4) Philp (1982)	(1) Unimproved grassland bank with *Galium saxatile*, *Lathyrus linifolius*, *Danthonia decumbens* and *Rosa micrantha*. A single bush seen at TR 0536 36407, probably more. (2) (a) Large patch of plants at TR 04757 36272 and several scattered bushes in paddock, with ponies and sheep. Land described by owner as being under pasture since Middle Ages. *Ulex europaeus* also present and also in adjoining paddock with four bushes of *Ulex gallii* at TR.0483 3636. (b) Two bushes beside footpath across sheep pasture at TR 0557 3655. More bushes likely on hillside to south west but recorder unable to check.

					(3) TR03N (4) TR03N.
Clowes Wood	TR1263, TR1362, TR1363	Access land	(1) 10 August 2021 (2) 16 July 2017 (3) 29 September 2012 (4) 28 July 2007 (5) 22 September 2004	(1) C) (2) CO (3) SB (4) KFC meeting (5) JP & JW	(1) TR1362. (2) (a) TR1362. Two plants in open area south west of car-park: corolla deep yellow, calyx 11mm long, minute bracteole. (b) TR1363. Large plant just by main track at reservoir. (3) (a) About 12 plants in cleared area near pylons at TR 1298 6272 with *Calluna vulgaris*. (b) est. 200 plants of mixed age in 600m stretch of open heath, cleared within forestry area, from TR 13622 62876 to pylons at TR 13010 62728 with scattered bushes alongside rides in vicinity. (4) Reported by different attendees as at TR 1302 6337, TR 128 632 and TR 133 628; also (August 2007?) as six small colonies at TR 13241 62913. (5) TR 128 632.
Stelling Minnis Common	TR14N, includes TR1446, TR1447	Access land	(1) 29 January 2023 (2) 11 August 2017 (3) 18 September 2012 (4) 14 September 2011 (5) 14 March 2011 (6) 15 April 2010 (7) 25 April 2004 (8) 1991-99	(1) SB (2) LM (3) CO (4) SB (5) SB (6) JH & JP (7) JP (8) EGP	(1) Scattered bushes in the vicinity of TR 1432 4676. (2) Recorded at TR 1431 4671, TR 144 469, TR 145 468, TR 146 464, TR 147 463 and TR 149 464 in possible extension to Local Wildlife Site. (3) TR1447, around common Several large bushes. (4) (a) c.20 bushes scattered on Stelling Minnis Common, west side of Bossingham Road between TR 14446 47039 and TR 14476 47597. Most of population within a grazing enclosure, privately owned and managed with KWT advice. (b) c.60 bushes scattered on Stelling Minnis Common, east side of Bossingham Road, between TR 14627 47580 and TR 14585 47483, within a grazing enclosure privately owned and managed with KWT advice. (5) TR 14332 47132, TR 14459 47292, TR 14482 47313, TR 14483 47329, and TR 14481 47360 at Common. (6) TR 145 476. (7) TR 145 476. (8) TR14N.
Etchinghill / Tolsford Hill	TR1538		11 November 2012	SB	Patch of plants around 6 x 6m at TR 15946 38366 with *Ulex europaeus.*
Swingfield Minnis	TR24H		1995-99	EGP	Hill House Farm, TR24H.

Umbilicus rupestris (Salisb.) Dandy (Navelwort)

vc 15 & 16

Rarity / scarcity status

Umbilicus rupestris is primarily a native of the western British Isles, extending north to central Scotland, a Mediterranean-Atlantic species. In east and central England it is infrequent and some occurrences are likely to be derived from introductions. Its threat status for conservation purposes is of 'Least Concern', both in England and Great Britain as a whole. In Kent, it was assessed as being scarce on the basis of records in Philp (2010) together with metropolitan West Kent data, but subsequent records are enough that it no longer qualifies as rare or scarce, although far from common. However, if records are discounted which are likely to have an introduced origin, the species may be treated as **scarce** in the county.

Mount Ephraim, Faversham. Photo by Lliam Rooney, 29 June 2010

Account

The first Kent records for *Umbilicus rupestris* are by Edward Jacob in his *Plantae Favershamienses* (1777):' *On* Tenterden *Church*, *and in a Stone Pit at* Boughton Monchelsea – *very uncommon*'. Apart from these, Hanbury and Marshall (1897) were only able to cite four records, widely scattered across the county, and they considered it to be a rare and local native of walls, rocks, etc. Francis Rose assembled more records and in the 1960s was aware of six current localities, almost all on walls. The only more 'natural' habitat amongst these localities was tree trunks by the drive at Scotney Castle (1961 and still present in 2018 but in vc14, East Sussex), and it is not impossible that this was originally a wild gardening introduction. Jacob's record on the ragstone of Boughton quarries was not necessarily as 'natural' as might be supposed, if not different from Walter Reeves' (1819-1892) find on an old wall at Boughton (although this could equally be evidence of wider spread).

Philp (1982) considered it to be native, although perhaps introduced at most of the localities in Kent and found on old walls and about old buildings such as churches; in 1971-80 it was recorded in six tetrads. Philp (2010) recorded it in eight tetrads in 1991-2005, noting only those plants which appeared genuinely wild. Amongst these was the appearance of Navelwort on an old ragstone wall near Aylesford Church in 2002, persisting and increasing since, well distant from any known wild or cultivated population and not likely to have been overlooked before (Eric Philp lived a few yards away). Our 2010-24 records, however, covered 23 tetrads (25 monads). This increase is not explained by earlier surveys being confined to the administrative county, as only two of the 19 tetrads were in Greater London. These 2010-24 tetrad records show that:

- nine records were clearly or probably garden-related, generally on the outer face of a garden wall;
- three records were either on a church or a churchyard wall[895];
- some occurrences were of long-standing, e.g. East Stour Farm, Godmersham, brick garden wall (1947-2016), Goodnestone church or churchyard wall (1929-2023) and, remarkably, Digges Place[896] (1839-2014);
- very few records were in anything like a 'natural' habitat, although Navelwort was seen on a fenced-off outcrop of Tunbridge Wells Sandstone in a residential road;
- there were sightings which seem explicable only by wind-borne seed originating well distant, e.g. a concrete bridge abutment slope over the A2 near Bexleyheath and a roadside retaining wall at Erith (not garden-related);

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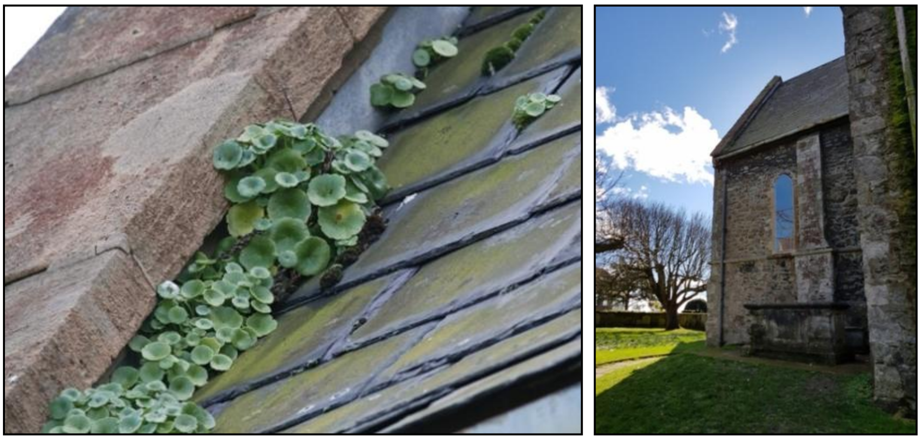
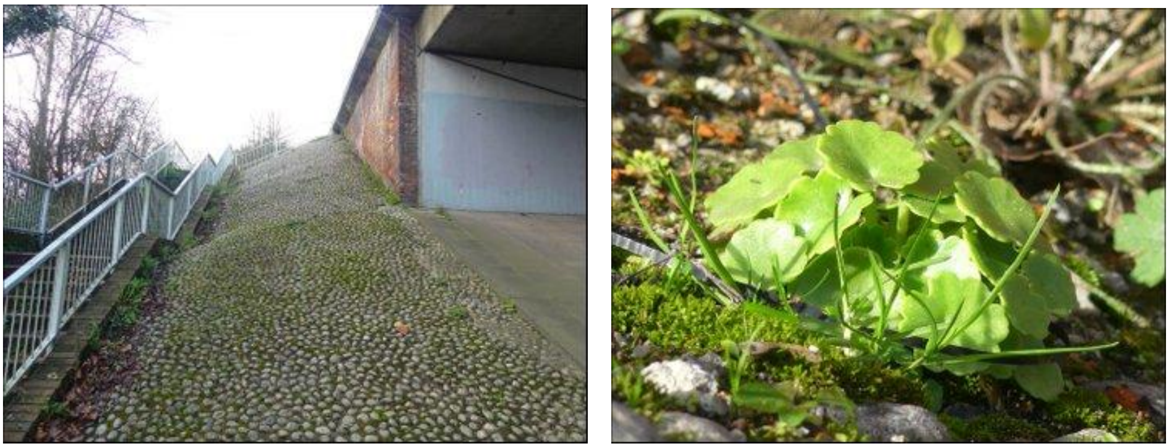
[895] If one includes historical sightings, the list of church / churchyard occurrences includes Allhallows, Folkestone, Goodnestone, Hawkhurst, Tenterden, Westwell.

[896] Recorded by the Rev. T.H.M. Bartlett in Matthew Cowell's *A Floral Guide for East Kent, etc*. (1839) as 'Cotyledon umbilicus, *walls of Mr. Sankey's farm*'. The Barham tithe commutation survey of 1842 gives John Sankey as occupier of Diggs Place House and lands farmed with it.

- most records were of fairly modest quantities of the species, but at Coombe Bank (now Radnor House School), Brasted, it was present (2020) along over 100m of a ragstone retaining wall with outlier further away on brick walling; it is assumed that, this being alongside the east carriage drive to the former mansion house, it is likely to derive from an introduction. The most diverse spread in the county, however, appears to be in TR2235, the centre of Folkestone, from the church of St. Mary & St. Eanswythe westwards with a wide scatter on roofs, walls, trees, building frontages and around pavements (although the pavement locations come and go with council cleaning). Presence on the inaccessible church roof suggests either bird- or wind-dispersed seed, and the explanation may well be the latter.



Church roof, Folkestone. Photos by Sue Buckingham, 1 March 2019



Bridge support slope, Bexleyheath. Photos by Mike Robinson, 11 February 2020

It is often pointed out how the numerous, light, dust-like seed of orchid species can be conveyed long distances by wind to establish in suitable conditions. The position is similar as regards *Umbilicus rupestris* seed, whose average mass is 0.0087mg. By way of comparison, the figure for *Orchis mascula* (Early-purple Orchid) is 0.0098 mg and the seed mass of both is several orders of magnitude lighter than that of many wind-distributed species, e.g. *Jacobaea vulgaris* (Common Ragwort) at 0.25mg).[897] The comparison with *Orchis mascula* is not exact, as the average seed output per plant of *Umbilicus rupestris* is 18,700 (56,000 for *Orchis mascula*) but it is nonetheless fair to conclude that the output is significant and its wind-dispersability is high.

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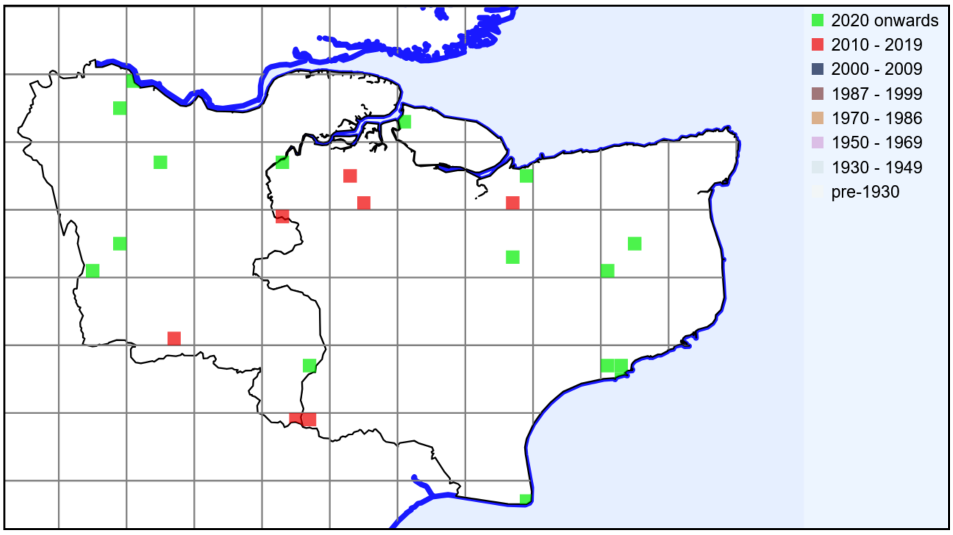
[897] Salisbury, Sir E. (1976). Seed output and the efficacy of dispersal by wind. *Proceedings of the Royal Society B* **192**: 323-329. This paper, however, appears to be in error in computing relative dispersability (average height of fructification in cm divided by average seed mass in mg). *Umbilicus rupestris* should be second out of 25 species in its dispersability score, not tenth (score of 2,873, not 287) as the paper incorrectly gives.

It is by no mean impossible that some of our occurrences derive from seed brought on the prevailing winds from the West Country. The Bexleyheath and Erith occurrence mentioned above are candidates for this, and are echoed by occasional central London appearances from 2000 onwards which are discussed in Edgington (2002)[898] with possible causes for establishment including a run of mild winters, to which Hodgson (2002[899]) adds a need for wet summers, so that the plant, having put on vegetative growth during a mild winter, is not killed prematurely by drought.

Folkestone. Photos by Phil Green, 10 April 2019

Umbilicus rupestris is a plant of vertical or inclined surfaces, generally rocky and often shaded and sub-humid, so it is not be surprising that wind-borne seed would establish on the most frequently available habitat of this nature in Kent, namely buildings and walls, although this of course would be the case for introductions as well. Either origin would result in a fairly random, discrete distribution across the county, which is what we see in the accompanying distribution map.



Umbilicus rupestris **Kent records to 2024 mapped at tetrad level, from BSBI database.**

The transfer from 'natural' environments to available artificial proxies has its parallels elsewhere, e.g. in its Mediterranean distribution the species has extended from being a member of typical pioneer communities of rock crannies, shade-tolerant and avoiding extremes of wetness or dryness, to growing as a typical plant on Roman ruins[900]. In Kent it generally grows on basic surfaces, such as ragstone or mortar in walls (brick, flint, etc.) or concrete; but it has been seen on the acid sandstone of the Tunbridge Wells Formation. It is a perennial species, whose normal limitation in the British Isles to the Atlantic climate of the west appears to indicate sensitivity to very low winter temperatures in the east, although it seems that it is possible for adaptation to arise quickly in a population once established in the east, probably as a result of inherent variability of the temperature response of seed germination. This could result in self-selection for spring germination, leading to larger plants with greater frost tolerance than would result from autumn germination.[901] Drier summers in the east might be supposed to present a potential problem for the survival of seedlings and, indeed, summer-green individuals generally (which do not include those that flower and fruit), but *Umbilicus rupestris* has some ability to cope with this. It responds to periods of drought by switching from normal photosynthesis into a survival mode in which the leaf stomata remain closed for much of the day, opening at night, to avoid transpiration; the ability to sustain growth is much reduced, which ties in with leaf formation taking place primarily in autumn or early spring.[902]

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[898] Edgington, J. (2002). *Umbilicus rupestris* - Eastward Ho? *BSBI News* **90**: 12-13.

[899] Hodgson, J.G. (2002). *Umbilicus rupestris* - (slightly) Eastward Ho. *BSBI News***91**: 31-32.

[900] Ceschin, S., Bartoli, F., Salerno, G., Zuccarrello, V. & Caneva, G. (2016). Natural habitats of typical plants growing on ruins of Roman archaeological sites (Rome, Italy). *Plant Biosystems* **150**: 866-875.

Umbilicus rupestris is not readily confused with any other Kent plant.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Crockham Hill	TQ45K, includes TQ4450, TQ4550		(1) 23 February 2022 (2 19 March 2011 (3) Before 1981, after 1970	(1) GK (2) GK (3) Philp (1982)	(1) As (a) and (b) below. (2) (a) TQ 44961 50681, well naturalized on outside of garden wall where presumably introduced originally. (b) TQ 4504 5070, around tree roots on stream-bank outside garden (same garden). (3) TQ45K. [Distinguishable from 1950s records for Crockham Hill, where it grew at TQ 441 503 on a wall on the west side of the B2026 (per RMB.]
Sundridge	TQ45X, includes TQ4855		(1) 13 January 2020 (2) 2011 (3) 1991-99	(1) GK (2) CC (3) EGP	(1) Abundant along low ragstone retaining walls either side of Combe Bank Drive from TQ 4824 5567 to TQ 4816 5578, i.e. for over 100m, plus an outlier on old brick walled garden adjoining drive further south west. (2) TQ4855, on old walls, Combe Bank Drive (3) TQ45X
Bexleyheath	TQ4974		11 February 2020	MR	TQ 499 741, three plants on steep incline of pebbles set in concrete by steps down from A220 to south side of A2.
Erith	TQ5078		(1) 12 May 2024 (2) 9 September 2017	(1) & (2) MR	(1) Still present on retaining wall by Fraser Rd in spite of recent major work to it. (2) TQ 50912 78036, small population on wall beside Fraser Rd.
Between Southborough and Rusthall	TQ54Q, includes TQ5740		(1) 28 February 2016 (2) Before 1981, after 1970	(1) GK (2) Philp (1982)	(1) TQ 5754 4034, Culverden Down, growing on n w side of road in fenced-off grounds on damp vertical shaded rock face. Also on opposite, s e, side of road outside gardens, on mossy concrete capping over sandstone outcropping, 40-50 small plants scattered over several metres length. (2) TQ54Q
Farningham	TQ56N, includes TQ5467		(1) 2011-20 (2) 1991-99	(1) RMB (2) EGP	(1) Records for 2011, 2012 (twice), 2013, 2020 relating to TQ 54400 67061, brick wall by Judas Tree at

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[901] Woodward, F.I., Fogg, G.E. & Heber, U. (1990). The impact of low temperatures in controlling the geographical distribution of plants. *Philosophical Transactions of the Royal Society of London* B **326**: 585-593.

[902] Daniel, P.P., Woodward, F.I., Bryant, J.A. & Etherington, J.R. (1985). Nocturnal accummulation of acid in leaves of Wall Pennywort (*Umblilicus rupestris*) following exposure to water stress. *Annals of Botany* **55**: 217-223.

					front garden of Mount Pleasant, Sparepenny Lane. Presence on wall, tree and garden below has varied, and in 2020 there were four plants, of which two were epiphytic, none on wall. (2) TQ56N
[Scotney	TQ63X, includes TQ6835		(1) 26 August 2007 (2)Before 1981, after 1970	(1) EGP & PH (2) Philp(1982)]	[In vc14, East Sussex.]
Borough Green	TQ65D		1991-99	EGP	TQ65D
The Moor, Hawkhurst	TQ72P, includes TQ7529		(1) 29 April 2015 (2) 15 November 2006	(1) SB (2) EGP	(1) 13 plants on inside of churchyard wall at TQ 75562 29487. May have been introduced but obviously self seeding. (2) TQ72P.
Conghurst, Sandcross	TQ72U, includes TQ7728		(1) 26 May 2015 (2) 1991-99	(1) JP (2) EGP	(1) TQ7728, locally abundant on sandy south-facing hedge bank and walls of farmhouse. (2 TQ72U
Rochester, vc16	TQ7367		24 May 2024	SP	TQ 736 673, growing on roofs of three houses, nos 94, 102, 104 Borstal Rd. Photo provided of plants at gutter level.
Aylesford	TQ75J, includes TQ7359		(1) 13 November 2017 (2) 3 June 2010 (3) 2002	(1) DC (2) DG (3) EGP	(1) TQ 73007 59016, one plant on old wall. (2) TQ 7300 5902, Vicarage Close, Aylesford, one plant on wall. (3) TQ75J, old ragstone wall near Aylesford church, first appearance.
Cranbrook (vc16)	TQ7736		8 March 2024	SB	Plants spreading for at least 6 metres on a steep roadside earth bank at TQ 3652 3651, west side of Waterloo Road.
Hartlip	TQ8364		17 March 2014	SB	12 or more plants on bare roadside bank at TQ 83942 64185, presumably originating from a large colony on a brick wall inside the adjacent garden
Stockbury	TQ8461		8 December 2019	GK	TQ 8409 6187, spread over roadside flint and brick wall in front of Cherry Trees, The Street.
Sheerness	TQ9073		(1) 9 June 2023 (2) 27 August 2017	(1) GK (2) DC	(1) TQ 90808 73475 to TQ 90800 73531, along concrete footpath and sea defence wall, also old brick adjoining, abundant, presumably much more than when discovered in 2017. (2) TQ 90686 73243, several plants growing on concrete path through docklands (shady position).
Chilham	TR05R, includes TR0752		(1) 4 June 2023 (2) 24 June 2022 (3) 13 November 2016 (4) Before 1981, after 1970	(1) AL & JM (2)RM (3) GK (4) Philp (1982)	(1) TR 0748 5207. Several clumps on a wall by the seed merchant's. (2) TR075 520, Chilham. (3) TR 0753 5205, brick garden wall of East Stour Farm, presumably planted originally, but established, and spread to outside base of wall. (4) TR05R. [Present here on old flint wall, 1947.]
Mount Ephraim, Faversham	TR0660		29 June 2010	LR	TR 06398 60026. Mount Ephraim Gardens. Not known as planted, but established and assumed introduced.
Dungeness - south east ness	TR0916		7 June 2022	OL & JTM	TR 093 168. Growing between the planks of the boardwalk in one place by the New Lighthouse on Dungeness Point.
Barham	TR2050		(1) 4 June 2022	(1) CO	(1) 105 flowering spikes on outside

			(2) 24 March 2014	(2) SB	of walls of Digges Place: 77 on garden wall and 28 on external building wall. (2) 70 - 100 plants of all sizes on old flint wall at TR 2029 5084 outside Digges Place. Plants spread over about 12m of the wall with Polypodium interjectum, Cymbalaria muralis and Catapodium rigidum. No indication that these were garden escapes.
Folkestone	TR2135		10 April 2019	PG	TR 217 357, trees and walls along Grimston Gardens.
Folkestone	TR2136		(1) 11 January 2024 (2) 14 November 2021 (3) 10 April 2019	(1) SB (2) MAS (3) PG	(1) Same colony as recorded in 2021 but spead from footpath into carpark of Annies restaurant on other side of low wall and growing on the bark at the base of a large plane tree at T R2177 3611. (2) TR 2177 3608, growing on a low wall next to a footpath connecting Shorncliffe Road with Cheriton Road, about 30 or more seedlings and a few mature plants. (3) TR 217 361, quite a lot on the wall of an alley alongside college, running between Shorncliffe Road and Cheriton Road (all at the Shorncliffe Road end).
Folkestone	TR2235		(1)2 5 May 2024 (2) 27 February 2022 (3) 5 February 2021 (4) 10 April 2019 (5) 1 March 2019	(1) ME (2) IH (3) SB (4) PG (5) SB	(1) TR 227 357, on stonework near the top of the cliff lift. (2) TR 22926 35845, on a wall, beside a steel gate SW of church, several plants. (3) TR 22749 35806, several plants growing at ground level from gaps in brickwork and paving between Barclays Bank and the Zombie Monkey Tattoo house, West Terrace. (4) Abundant around town centre and to west, on roofs, trees, walls pavements etc. including (as sample locations) (a) TR 22643 35786, by drainpipes and ventilation bricks of 88 Sandgate Road; (b) TR 22640 35859, door frames at rear of postal sorting office (where persisted until 2020; on 12 March 2022 remaining on nearby window ledges, PG); (c) TR 22755 35841, cannon ball monument in shopping precinct, Sandgate Road; (d) TR227 358, roofs of buildings at junction of Sandgate Road and West Terrace. (5) A cluster of plants on the roof of St Mary and St Eanswythe church at TR 2297 3587.
Folkestone	TR2236		19 January 2024	SB	A few small plants on a wall at TRc2215 3614.
Folkestone harbour	TR2336		29 May 2024	DS	TR 23507 36118. One healthy looking flowering clump on the inner harbour wall above the high tide line.
Barham	TR25A, includes TR2050		(1) 24 March 2014 (2) Before 1981, after 1970	(1) SB (2) Philp (1982)	(1) 70 - 100 plants of all sizes on old flint wall at TR 2029 5084 outside Digges Place. Plants spread over about 12m of the wall with *Polypodium interjectum*,

					Cymbalaria muralis and *Catapodium rigidum.* No indication that these were garden escapes. (2) TR25A. [Known here since 1839.]
Goodnestone	TR25M, includes TR2554		(1) 4 June 2023 (2) 22 March 2012 (3) 1991-99 (4) Before 1981, after 1970	(1) KFC meeting (SL) (2) SB (3) EGP (4) Philp (1982)	(1) KFC bioblitz, Holy Cross Churchyard, Goodnestone, TR 2546 5457 / TR 2546 5458. 11 small flowering plants on low flint wall next to south entrance of church / 1 large flowering plant at sheltered junction of tower and north aisle. (2) On Goodnestone church wall, TR 25452 54584, competing with ivy. (3) TR25M. (4) TR25M. [Present on church wall at least since 1929.]

Utricularia vulgaris L. (Greater Bladderwort)

vc 15 & 16

Rarity / scarcity status

Utricularia vulgaris is a **nationally scarce** aquatic of still or slow base-rich waters, and grows scattered across the British Isles, especially in East Anglia, but is likely to be more widespread than records show, because of the difficulty of identification when not in flower. (When not in flower, it is best recorded as *Utricularia vulgaris* sensu lato, which would include *Utricularia australis*, Bladderwort, as well.) Its threat status for conservation purposes in both England and Great Britain as a whole is of 'Least Concern'. There is evidence of strong decline in Kent (although this may be no more than a re-assessment of identity) and it is currently **rare** in the county overall, although with numerous records at Stodmarsh. With other Bladderworts it is a Kent axiophyte and so is indicative of good habitat.

Stodmarsh. Photo by Lliam Rooney, 11 August 2016

Account

The first Kentish occurrence of *Utricularia vulgaris* is obscured by confusion with *Utricularia australis* (formerly *U. neglecta*). This latter species was not recognised in the county until 1867, when F.M. Webb published his discovery of it at Ham Marshes / Oare Stray[903], which then opened the question of how far botanists in the county had been mis-calling it *Utricularia vulgaris* elsewhere. Hanbury & Marshall (1899) describe *Utricularia vulgaris* as a native of ditches and pools; local, though not uncommon, especially near the coast, and they give a series of records, many pre-1867, although qualifying the ('Some of these localities may belong to *U. neglecta'*). They gave Edward Forster's *Flora Tonbrigenis* (1816) as the first county record ('In ponds, near Langton Green, in the grounds of Baden Powell, Esq. and at Bidborough'),but he gave *Utricularia vulgaris* as the only name available. The geology of his locations is Ardingly Sandstone which produces acid habitat, and is unlikely to suit the species. A better candidate for the first record might be that from Margate by Dr R.E. Hunter (1755-1824), but for his reputation for unreliability; or G.E. Smith's 'In dykes at Ham ponds, frequent, associated with the elegant Hottonia, and Alisma [Baldellia] ranunculoides' (*A Catalogue of rare or remarkable phaenogamous plants, collected in South Kent*, 1829), but that both *U. australis* and *U. minor* (Lesser Bladderwort) also have purported records there as well.

A reconstruction of distribution trends for *Utricularia vulgaris* is of limited practicality. General accounts for Kent *U. vulgaris* have suffered from uncertainty. Francis Rose's manuscript *Flora of Kent* treated it as a native of 'marsh and fen ditches, ponds, flooded gravel pits; rare generally, but locally frequent and even abundant in [the lower Stour alluvial marshes to Sandwich]... a species of base-rich habitats'. He included numerous records from the 1940s, 50s and 60s relating to the Stour catchment from Fordwich to Sandwich, albeit that only one is mentioned as being in flower; and he included a number of West Kent records which do not seem to be from base-rich habitats, so that he credited it to ten hectads overall. His accounts of *U. australis* and *U. minor* are both square-bracketed as though not regarded as current species, although he added a report of *U. minor* from Burmarsh in the 1970s (which is doubtful). It is possible that his views would have evolved further - all Hampshire *U. vulgaris* records were rejected in the *Flora of Hampshire* 1996, of which he was co-author.

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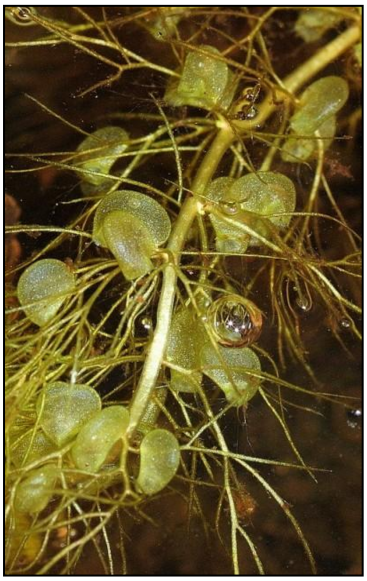
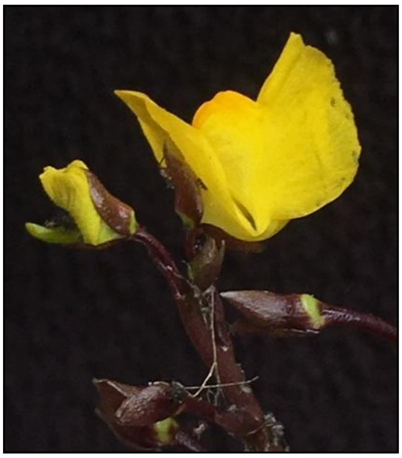
[903] Webb, Fred. M. (1876). On Utricularia neglecta, *Lehmann*; and on U. bremii, *Heer*, as a British plant. *Journal of Botany* **14**: 142-147



Worth Minnis. Photo by Lliam Rooney, 5 July 2011

Eric Philp's views seem to have evolved as well. In Philp (1982) he mapped *U. vulgaris* and *U. australis* together under *U. vulgaris*, noting that 'there has been some confusion between the two species and further research is required' - there had been a couple of positive identifications of *U. australis* and this species 'might also account for some of the other records'. By the time of Philp (2010) the position had been reversed; it was *U. australis* which was to be expected and was credited with 20 tetrad records, and *U. vulgaris* had only been positively identified in two tetrads in the Hacklinge/ Worth Minnis area[904]. Since then we have re-found it in those tetrads and neighbouring tetrads; and many records have been forthcoming from the Stodmarsh National Nature Reserve, especially during the course of a Natural England ditch survey in 2022. In this register, we are treating the species as currently confined to those two areas, and the data table below is limited to them accordingly, with records highlighted where positive identification exists (which should be as a result of examination of flowering material). There have been reports of the species from other sites, of which perhaps the most likely are the Ash Levels (1985; TR 3109 6184) and Holborough Marshes (1989-2016; TQ7062), but we have not been able to establish that these reports have been confirmed with flowering material[905].



Stodmarsh. Photo by Danny Chesterman, 18 August 2018

Utricularia species are carnivorous plants which capture and digest small organisms in swollen structures (the 'bladders' of Bladderwort) growing along leaf-shoots branching off the stolons. *U. vulgaris* lacks roots, and floats in the water just below the surface, although the flowers, which are rarely produced, are aerial. Whilst growth is rapid at the tips of the plant, it dies back behind and each bladder trap has only a short effective life, so the whole plant is in a process of continuous renewal to maintain its trapping capacity; about half the plant's biomass is invested in the bladder traps[906]. Nutrient intake is not derived solely from trapped prey, and the green leaf-shoots have some photosynthetic ability as well.

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[904] When the writer examined the BSBI database records for the purpose of preparing this account, it was evident that some confusion had arisen for the period of the Philp (2010) survey, 1991-2005, as there were apparently records by Eric Philp for *U. vulgaris* in the Romney Marsh and Stodmarsh areas, which in Philp (2010) were assigned to *U. australis*. The BSBI records had been taken direct from Eric Philp's computer, and a comparison with the original recording cards suggests that either *U. vulgaris* must have been keyed in by him on a number of occasions when he did not intend this, or the software involved in converting his Recorder data to BSBI database taxa did not match the taxa accurately. The recording cards for the BSBI database's supposed *U. vulgaris* records from Eric Philp for Romney Marsh actually gave *U. vulgaris* agg. for TR03A, TR03L and *U. australis* for TR92N, TR92P, TR93Q, TR03G, TR03M, TR03S, TR13B. For Stodmarsh TR26F and G, they gave *U. australis.* The database records have now been corrected to correspond.

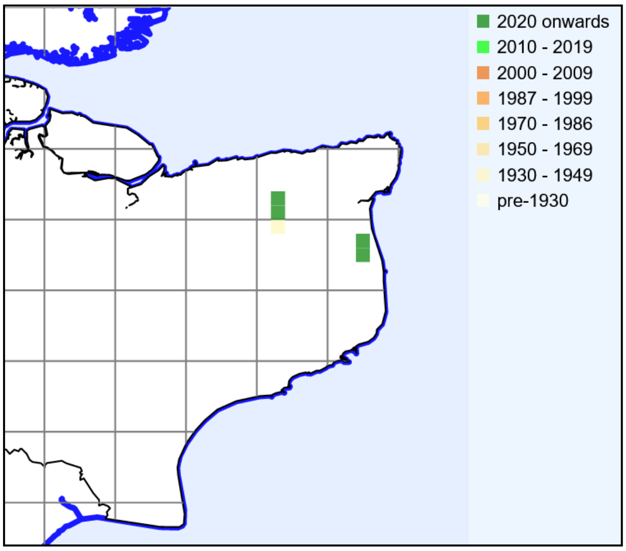
[905] However, Philp (2010) gives *Utricularia australis* as probably the species seen without flowers in the relevant tetrad, TQ76B, for the 1991-2005 survey

[906] Friday, L. E. (1988). *Utricularia vulgaris,* an aquatic carnivore at Wicken Fen. *Nature in Cambridgeshire* **30**:50-54.

Identification of *U. vulgaris*, and in particular its separation from *U. australis*, is not straightforward and require the presence of flowers. Characters of leaf-segment margins and the quadrifid hairs inside the bladder traps have been used in *Utricularia* identification, but are not very helpful as between these two species. The flower-stalk of *U. australis* lengthens after flowering and becomes sinuous, whereas that of *U. vulgaris* is recurved, and does not lengthen or become sinuous. Seed set will point to *U. vulgaris*, as *U. australis* has not been known to fruit in the British Isles, its spread being vegetative, via turions or fragments. Flower shape differs as between the two species, with *U. vulgaris* appearing narrower in frontal view (the corolla's lower lip appearing trapezoidal, with the sides folded back) because the corolla's lower lip in *U. australis* fans out sideways (appearing reniform). The distribution of glands inside the spur also varies, being more extensive in *U. australis*.

Worth Minnis. Photo by Lliam Rooney, 5 July 2011

In terms of habitat, *U. vulgaris* is regarded in the British Isles as favouring base-rich conditions, with *U. australis* appearing to have a wider tolerance. However, there may not be a great deal of difference. Analysis of Polish microhabitats for the two species gave a mean pH of 7.15 for *U. vulgaris* and 6.20 for *U. australis* (7 of course is neutral[907]). The same analysis tended to group these species together as regards water chemistry preferences, both preferring eutrophic waters. As regards habitat at Stodmarsh, overall there has been a considerable increase in the amount of *Utricularia* there between the 1990s and 2022, which could perhaps be attributed to a variety of causes, but seems quite likely to be associated with the expansion of the reedbeds created in the late 1990s[908].



***Utricularia vulgaris* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Below: records in green font are those known to have positive identification of flowering material.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Stodmarsh	TR26F, includes TR2261	SSSI, National Nature Reserve	(1) 25 August 2023 (2) 19 September 2022 (3) 10 September 2022 (4) 2 September 2022 (5) 9 August 2022 (6) 1 August 2022 (7) 5 July 2022 (8) 9 June 2022 (9) 10 October 2020 (10 19 August 2019 (11)18 August 2018	(1) AL & JM (2) AL (3) AL & JM (4) AL & BHa (5)) AL & KO (6) AL & JM (7) AL (8) AL (9) AL (10) AL (11) KBRG / KFC	(1) TR 2242 6137, reedbed ditch and TR 2256 6153, reedbed ditch. (2) ditch survey- TR 2279 6158, TR 2264 6173, TR 2269 6163 reedbed ditch, TR 2270 6152 reedbed ditch, TR 2275 6152 reedbed ditch, TR 2281 6150, TR 2275 6148. (3) ditch survey – TR 2252 6157 reedbed ditch, TR 2245 6154 reedbed ditch, TR 2227 6173, TR 2223 6169 reedbed ditch, TR 2219

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[907] Kosiba, P. (2004). Chemical properties and similarity of habitats of *Utricularia* species in Lower Silesia. *Acta Societatis Botanicorum Poloniae 73*: 335-341.

[908] Lockton, A. (February 2023). *The Flora of Stodmarsh National Nature Reserve*.

			(12) 11 August 2016 (13) 20 June 2014 (14) 21 September 2013	meeting (12) AL & LR (13) AL & JM (14) AL & JM	6181 reedbed ditch. (4) ditch survey – TR 2230 6158 reedbed ditch, TR 2244 6138. (5) ditch survey – TR 2256 6198, TR 2257 6190, TR 2264 6184, TR 2273 6185, TR 2249 619. (6) TR 2260 6182. Ditch survey. Abundant in the new pool west of the Marsh Hide; apparently gone from the other pool where it used to be. (7) TR 2258 6134. Flowering profusely; lower lip with reflexed margins. (8) TR 226 618. In the lake in front of the hide, under *Azolla* (9) TR 2277 6190, ditch. (10) TR 2268 6184, TR 2269 6194, TR 2271 6189. (11) Stodmarsh SSSI / NNR (Unit 11) KBRG / KFC joint meeting. Lampen Stream from foot-bridge, TR 2238 6129. Open water in flooded area north of Marsh Hide, TR 2264 6183. Flowers collected and determined in both areas, but flowering abundantly in many other areas across site. (21) TR 2234 6194, ditch. (13) TR 2265 6183, filling the lake. (14) TR 226 618, a huge amount, in flower, filling the lake in front of Marsh Hide.
Stodmarsh	TR2262	SSSI, National Nature Reserve	(1) 30 August 2022 (2) 30 August 2022 (3) 9 August 2022 (4)19 September 2021 (5) 8 August 2021 (6) 1996 (7) June/July 1991	(1) AL, BHa & KO (2) AL & BHa. (3) AL & KO (4)AL (5) AL (6) PW & BB (7) CD	(1) TR 2274 6240, ditch survey. (2) TR22636232, ditch survey. (3) ditch survey- TR 2248 6206, TR 2237 6205, TR 2235 6217, TR 2249 6197. (4)TR 2278 6220, TR 2283 6214, TR 2284 6220. (5) TR 2293 6206, fairly recently cleared ditch with cattle-grazed margins. (6) TR 2237 6205. (7) TR 2224 6223.
Stodmarsh (Upstreet – Wickhambreaux Valley)	TR2362	SSSI, National Nature Reserve	(1) 8 September 2023 (2) 5 August 2019 (3) 17 August 2014 (4) 5 August 2014 (5) 7 July 2014	(1) AL & JM (2) AL (3) AL & JM (4) AL & JM (5) AL & JM	(1) TR 2337 6274. (2) TR 2301 6207, in a ditch where not seen by recorder before. (3) TR 2340 6231, in a shallow arm of the lake in front of Harrison's Drove Hide. (4) TR 2325 6258, in flower in a ditch. (5) TR 2323 6262, abundant in the lake in front of the Feast hide.
Hacklinge/Worth Minnis	TR35M, includes TR3454, TR3455, TR3555	SSSI, RSPB reserve	(1) 12 August 2023 (2) 21 July 2022 (3) 13 July 2022 (4)9 July 2018 (5) 5 September 2013 (6) 5 September 2006 (7) 2003 (8) 23 June 2002 (9) 1982	(1) KFC meeting (2) & (3) SB) (4) DC (5) GK & LR (6) JC (7) CEC (8) EGP (9) ACH	(1) RSPB Lydden Valley, flowering in the open in ditch inside Great Wood and in shade in a ditch on the eastern side at c. TR 345 559. (2) RSPB reserve, Willow Farm, ditch between comp 8 and 7 Three flowering spikes from a mass of vegetative material at TR 35949 55558. Identification confirmed by microscopic examination of spur glands. (3) Flowering in profusion along the length of ditch at TR 343 557. This is the ditch which held a sizeable but recently declining population of *Isolepis cernua,*

					Baldellia ranunculoides and *Potamogeton coloratus*. The ditch, on RSPB owned land, had become overgrown, was dredged recently and this year held no plants of those last three species. Glands seen only on abaxial side of spur and flower profile correct for this species. (4) TR 34973 55003, flowering In a dyke near the pumping station. (5) TR 3427 5578, one flower spike in ditch through pasture with plentiful non-flowering *Utricularia*. (6) TR35M. (7) Hacklinge Ditch Survey TR 34400 55818, TR 34472 55879, TR 35670 55980, TR 35930 55500, TR 35951 55231, TR 34767 55784, TR 34790 55180, TR 34275 55782, TR 34856 55397, TR 35010 55140, TR 35760 55640, TR 35880 55410, TR 34335 55968, TR 34590 54150, TR 35072 55290, TR 35760 55600, TR 35760 55640. (8) TR35M. (9) Hacklinge Ditch Survey TR 35457 55767, TR 35820 55214, TR 34259 55574, TR 34543 54977, TR 34856 55397, TR 35670 55980, TR 35723 55158, TR 34472 55879, TR 34767 55784, TR 35562 55157; TR 35578 55056.
East of Worth Minnis	TR35N, includes TR3456, TR3556, TR3557	SSSI	(1) 12 August 2023 (2) 5 September 2006 (3) 2003 (4) 2 March 2003 (5) 1982	(1) KFC meeting (SL) (2) JC (3) CEC (4) ACH (5) ACH	(1) KFC meeting, Lydden Valley, Worth Minnis RSPB, ditch along edge of east side of Great Wood, TR 34515 56011. Flowering near where ditch enters wood. (2) TR35N. (3) Hacklinge Ditch Survey TR 34386 56260, TR 34241 56125, TR 34514 56007. (4) TR 362 555, TR 343 560, Sandwich and Pegwell Bay Survey. (5) Hacklinge Ditch Survey TR 34646 56011, TR 34655 56120, TR 35280 56090, TR 34646 56011, TR 35690 56030, TR 35076 57930, TR 34514 56007, TR 34749 56016, TR 35540 56040.
East of Lydden Valley	TR35S, includes TR3654, TR3655	SSSI	(1) 2003 (2) 1982	(1) CEC (2) ACH	(1) Hacklinge Ditch Survey TR 361505 5500, TR 36220 55380, TR 36163 55721, TR 36030 55120, TR 36040 55550 (2) Hacklinge Ditch Survey TR 36234 55865, TR 36040 55550, TR 36496 54916

Valeriana dioica L. (Marsh Valerian)

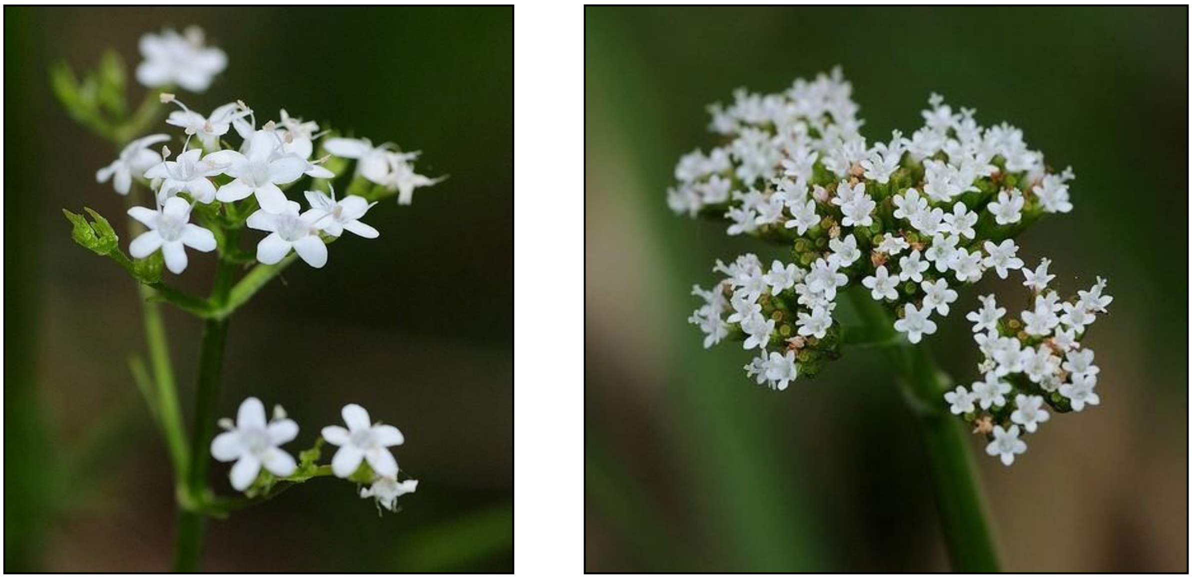
vc 15 & 16

Rarity / scarcity status

Valeriana dioica is a plant of wet ground widespread across Great Britain as far north as south Scotland but less frequent in the far south east and far south west of England. Its conservation risk assessment for Great Britain is of 'Least Concern' but a comparison of English data over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 25% reduction in the likelihood of recording the species, so that its English status is **Near Threatened**. In Kent it is **scarce**; it is a Kent axiophyte, so an indicator of good habitat

Account

The first Kent record was by Patrick Blair who noted in his *Botanick Essays* (1720) that it was dioecious, the male and female plants having been given different names in the past: 'I remember, that when I went a Herborising towards *Woolwich*, in Company with that accurate and expert *Botanist* Mr. Rand, we saw both, the *Valeriana Palustris minor floribus compactis*, and *laxioribus*, which seem'd to us to be two distinct Species, because we had no Suspicion that there would be *Male* and *Female- Flowers* in any Plant belonging to the Genus....It's a pretty low Plant about one Foot high, with a strait Stalk, but little branched with the *Folia Pinnata,* proceeding from the Stalk by Pairs, having the *Flowers Umbellatim Dispositi* on the top.'

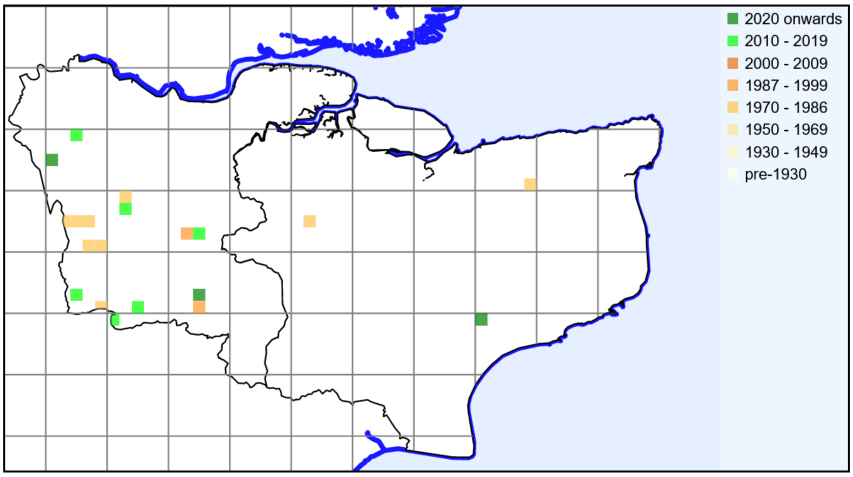


Brenchley Wood, male (left) and female (right) flowers. Photos by Lliam Rooney, 12 May 2011

There were other 18th century records at Charlton and Faversham; and Hanbury & Marshall (1899) summed it up as a native of bogs, water-meadows, etc. Although they described it as local, they cited records widely across the county, ranging from north west Kent near the Thames, to the Darent valley, Snodland, Faversham, around Thanet, the east Kent fens, Wye, Cheriton and Tunbridge Wells. Francis Rose in his manuscript Flora of Kent treated it as a plant of marshy meadows, fens, flushes in woodland on base-rich or calcareous soils, locally frequent in the High Weald and the east Kent fens, rare elsewhere. His east Kent records from the 1940s and 1950s included Ham Fen, Hacklinge Marshes, Worth Minnis, fens north of Wingham, Preston Marshes, Northbourne Fen, Stowting Meadows, Charing Heath (TQ 916 485) and Gibbons Brook; we have recent records from none of these except the last from 2011 onwards, where it is present (as noted in 2020) in shrinking areas of open base-rich fen formed over peat.

By the time of the 1971-80 county survey published in Philp (1982), Marsh Valerian was regarded as very scarce and apparently decreasing due to land drainage, with records in only 12 tetrads. This decline continued, with only five tetrad records noted for 1991-2005 in Philp (2010). Our 2010-24 records are a little better, with nine tetrads (11 monads), but still indicative of scarcity and, in the case of east Kent, near absence. The apparent decline is shown by the accompanying historical distribution map.

***Valeriana dioica* Kent records to 2024 mapped at tetrad level, from BSBI database.**



Francis Rose's 1940s/50s records do not appear here, as they are not part of the BSBI database, and were mostly not stated with grid-references. Marsh Valerian's distribution now appears western within the county, where most of our records are in wet woodland where the plant grows on flushed ground, not necessarily with any obvious base enrichment, such as Francis Rose's remarks, cited above, would suggest. Indeed, the norm would appear to be neutral or somewhat acid ground (e.g. Avery's Wood, Brenchley Wood, Padmall Wood), with base enrichment being more characteristic of the former east Kent fen occurrences. The woodland occurrences are at least likely to be in habitats less susceptible to loss than the traditional water-meadow locations, of which virtually none appears to survive, although there is still (2018) a patch in open marshy ground in a stream valley south of Edenbridge (perhaps having a relationship with a 1954 record from a calcareous flush in Greybury Gill).

Avery's Wood. Photo by Stephen Lemon, 19 September 2016

Marsh Valerian favours wet ground, generally with some movement in the direction of ground waters. Because of the creeping rhizomes and long stolons, it is patch-forming. Germination appears to be fairly indifferent to light[909], which accords with the frequency with which it is found in woodland.

When in a young vegetative state, it is not always easy to recognise, as the oval entire basal leaves do not bear resemblance to the pinnately lobed stem-leaves. It is smaller than *Valeriana officinalis,* with longer stolons and the latter's basal leaves are pinnate as with the stem-leaves.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Keston	TQ4164		(1) 20 May 2021	(1) SC, BH, JJ & IB	(1) TQ4164, male and female

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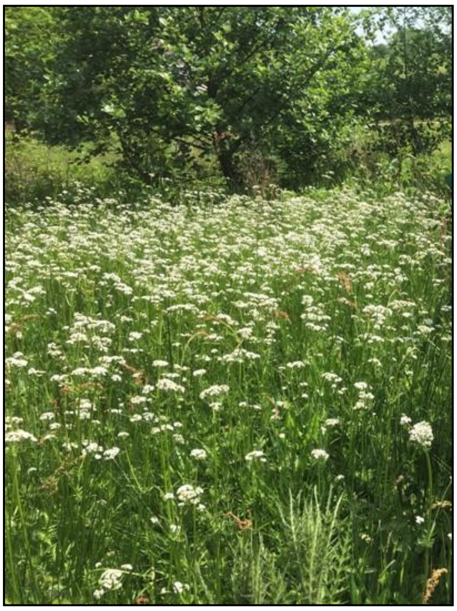
[909] Rasran, L., Eisenmann, C., Wagentristl, R. & Bernhardt, K. G. (2019). Germination requirements of the subordinate fen meadow species *Valeriana dioica* L. *Folia. Geobotanica* 54: 125-138.

(metropolitan vc16)			(2) 10 May 2010	(2) JP	plants in newly coppiced areas of compartments 3 and 1, Padmall Wood () TQ 416 649, Padmall Wood.
Cowden west	TQ44K		(1) 19 April 2007 (1) After 1990, before2006	(1)) JH, JP (2) Philp (2010)	(1) TQ 443 407. Marlpit.Shaw in marshy areas near streams. (2) TQ44K. May be same site as above, or as recorded by FR in 1944, by Scarletts Pond.
Edenbridge south	TQ44L, includes TQ4443		(1) 22 May 2018 (2) 11 June 2005 (3) After 1970, before 1981	(1) KBRG meeting (2) EGP (3) Philp (1982)	(1) TQ 442 434, a flowering circular clump several metres across in open marshy (slightly sloping) ground of stream valley north east of Clatfields. (2) TQ44L. (3) TQ44L.
Cowden east	TQ44V		After 1970, before 1981	Philp (1982)	TQ44V.
Westerham	TQ45H, includes TQ4355		(1) 17 June 1982 (2) After 1970, before 1981	(1) FR (2) Philp (1982)	(1) TQ4355, Westerham Wood. (2) TQ45H.
Westerham	TQ45M, includes TQ4455		(1) 1979 (2) After 1970, before 1981	(1) JP (2) Philp (1982)	(1) TQ 440 553, Westerham Wood.. (1) TQ45M [no further detail given, but eastern half of Westerham Wood is in this tetrad, so may be same as preceding record].
Toy's Hill	TQ45Q		After 1970, before 1981	Philp (1982)	TQ45Q [no further detail, but known to FR in alder carr at Scords Wood, 1950-57].
Brasted	TQ45S		After 1970, before 1981	Philp (1982)	TQ45S [may have been swampy field west of church, RAC].
Ide Hill	TQ45V		After 1970, before 1981	Philp (1982)	TQ45V
Petts Wood (metropolitan vc16)	TQ4568		(1) 2013 (2) 1988 (3) 1984	(1) JH (2) SPr (3) FR	(1) Persisting along edges of Kyd Brook, Willett Wood (2) TQ 450 687, valley flush in middle with *Caltha*, etc. (3) By stream in east part.
Petts Wood west (metropolitan vc16)	TQ4468		2013	IJ	TQ4468.
Gildridge	TQ4543		1989	JP	TQ 453 430.
Scadbury (metropolitan vc16)	TQ4570		1974	JP	TQ 455 700.
Ashurst	TQ5138		1 December 2019	SL	Stone Cross, east of Ashurst. Burrs Wood ghyll, spring on east side of ghyll just south of public footpath, TQ 5196 3827. Large clonal patches connected by rhizomes on flushed ground in and adjacent to spring line, producing only basal leaves.
Sevenoaks north	TQ5257		11 May 2011	GK	A small patch in wet woodland between A225 and. Sevenoaks Wildlife reserve.
Otford - Sevenoaks north	TQ55J		After 1970, before 1981	Philp (1982)	TQ55J. [There are 1950s records for meadow[s] north of Bat & Ball and south of Otford.]
Bullingstone	TQ5440		(1) 18 September 2016 (2) 10 September 2016 (3) 23 May 2014	(1) SL (2) SL (3) JP	(1) Avery's (Bullingstone) Wood, abundant as non-flowering plants in flushes on both scarps slopes: TQ 54207 40973, TQ 54187 40970, TQ5419340959, TQ5428340989, TQ 54265 40980. [re-det. as this sp in 2019.] (1) Avery's (Bullingstone) Wood, flushed ground at spring on western scarp of ghyll, c. TQ 5416 4095. Small patch of non-flowering plants with leaves only with

					vegetative spread by rhizomes. [re-det.as this sp.in 2019.] (1) In a flush
Bullingstone	TQ5441		18 September 2016	SL	Avery's (Bullingstone) Wood, non-flowering plants in flushes: TQ 54230 41000, TQ 54250 41003. More abundant in adjacent monad. [re-det. as this sp. in 2019.]
Matfield north west	TQ6442	KWT Reserve	(1) 14 October 2023 (2) 10 May 2010 (3) 13 May 2004	(1) KFC meeting (2) SB (3) DM, FB	(1) Small plants visible in good quantity in sphagnum bog in Brenchley Wood KWT reserve. (2) TQ 64676 42181, Brenchley Wood, plants in 4 patches in sphagnum flush and wet areas in woodland below, increasing due to clearance; both sexes (3) TQ 648 420.
Matfield north west	TQ64K		1991-2000	EGP	Brenchley Wood, TQ64K.
Matfield north west	TQ64L		1991-2000	EGP	Cinderhill Wood, TQ64L.
West Peckham	TQ65G		1991-2000	EGP	TQ65G.
Mereworth	TQ6553		21 May 2010	GK	Alders Wood (alder carr).
Yalding Fen	TQ6849		25 July 2010	JP	TQ6849.
Eyhorne Street	TQ85H		After 1970, before 1981	Philp (1982)	TQ85H.
South Blean Woods	TR0857		20 May 1988	JP	Wet ground along stream
Gibbin's Brook	TR13E, includes TR1138	SSSI, Access land	(1) 28 June 2023 (2) 6 June 2020 (2) 7 May 2015 (3) 30 June 2013 (4) 1991-99 (5) After 1970, before 1981 (6) 2 July 1979	(1) KBRG meeting (2) SL (2) JB (3) KBRG meeting (4) EGP (5) Philp (1982) (6) JP	(1) Gibbin's Brook southern mire, e.g. at TR 1160 3854. (2) Gibbin's Brook, TR 1158 3852. Shrinking areas of open base rich fen formed over peat in area south of pond, now ungrazed, going rank and scrubbing over. (2) Plentiful, ground surprisingly wet underfoot, TR1138. (3) TR1138, in corner of northern bog. (4) and (5) TR13E. (6) TR 118 380
Westbere	TR16V		After 1970, before 1981	Philp (1982)	
Ham Fen	TR3454		24 July 1991	FR	



Edenbridge. Photo by Geoffrey Kitchener, 22 May 2018

Brenchley Wood. Photo by Sue Buckingham, 13 May 2010

Valeriana officinalis L. (Common Valerian)

subsp. collina *(Wallr.) Nyman*

subsp. sambucifolia *(J.C. Mikan ex Pohl) W.R. Hayw.*

vc 15 & 16 for the species; subsp. *collina* has not been recorded recently in vc15

Rarity / scarcity status

Valeriana officinalis is widely distributed across the British Isles, growing in a range of habitats – subsp. *collina* (a tetraploid, 2n=28) in the drier ones, subsp. *sambucifolia* (an octoploid, 2n=56) in the wetter ones, although the two subspecies are not always clearly separable. The conservation risk assessment of the species for Great Britain is of 'Least Concern' but a comparison of English data over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 20% reduction in the likelihood of recording it, so that its English status is N**ear Threatened**. The English conservation status of both subspecies is unknown, as In Kent there is some evidence of decline, although as yet it is neither rare nor scarce in the county. It is a Kent axiophyte and so is indicative of good habitat.

Account.

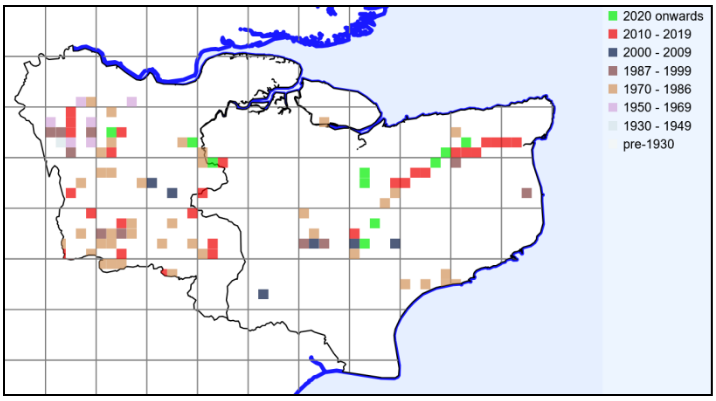
The first Kent record for Common Valerian was by Thomas Johnson (*Iter Plantarum*, 1629) between Dartford and Erith in marshy ground. It was regarded by Hanbury & Marshall (1899) as so frequent (at least as regards what was presumably subsp. *sambucifolia*, since they treated its habitat as being marshes, wet thickets and by streams and ditches) that they did not cite records and locations for it, other than remarking that it was particularly plentiful in the west and south. There are, however, indications of the local status of the species by local Flora writers such as Edward Jacob ('*On the Banks of* Ospringe River – *not uncommon'*, *Plantae Favershamienses*, 1777); Thomas Forster ('on bogs and sides of rivers, not unfrequent', *Flora Tonbrigensis*, 1816). Hanbury & Marshall (1899) did know of subsp. *collina* (under the name of *Valeriana mikanii*), but despite some indications of wider occurrence they accepted only one record as satisfactory, by Hanbury near Wye in 1875.

Subsp. *collina*, Crookhorn. Photos by David Steere, 19 June 2016.

Francis Rose remarked that the plant of scrub and wood borders is small and slender with narrow leaflets and is probably nearly always the tetraploid taxon (*collina*). He gave records (1901-1953) from east of Downe; Cudham Road, Green Street Green; Stone; the north border of Crookhorn Wood, Snodland; Birling Downs; Trosley Downs; Upper Halling; and Wingate Wood, north of Upper Halling. In East Kent he was, apart from the Wye record, only aware of it on an old flint wall at East Court Farm Godmersham. We largely lack differentiation of the subspecies since, as although Philp (2010) referred to both, they were not mapped separately, and the great majority may be expected to be subsp. *sambucifolia*. Indeed, our only recent records of subsp. *collina* are for a chalky valley near Lees Court Park (2023) and for the Crookhorn Wood area (2015-16) where present on good quality chalk downland with plants such as *Anacamptis pyramidalis* (Pyramidal Orchid), *Dactylorhiza fuchsii* (Common Spotted-orchid) and *Herminium monorchis* (Musk Orchid). Rose also referred to the plant of wet habitats being larger with broader, more deeply toothed darker green leaflets than the form on chalk; and probably nearly all his locations for this (and these were considerably more numerous and widespread than those for the chalk plant) were for the octoploid taxon (*sambucifolia*). The subspecies can be differentiated (although there is overlap) by subsp. *collina* having middle stem-leaves mostly with 15-27 leaflets, the terminal one being of similar width as the others, overall height is up to 50cm; subsp. *sambucifolia* has mostly 5-13 leaflets with the terminal one widest, overall height is up to 2m (we have recorded 1.5m at Lullingstone).

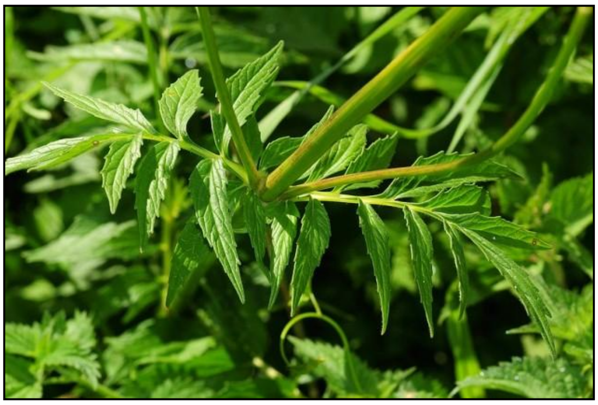
Subsp. *sambucifolia*, Wye. Photo by Lliam Rooney, 9 July 2015

Noting the variation in habitat, but not treating this as implying different taxa, Philp (1982) mapped 55 tetrads for the species *Valeriana officinalis*, describing it as rather local. By the time of the 1991-2005 survey (Philp, 2010), however, only 21 tetrad records were made and the species appeared to be in decline. The losses seem to be overstated, in that our 2010-24 records amount to 38 tetrads (45 monads), but nonetheless this suggests continued decline.

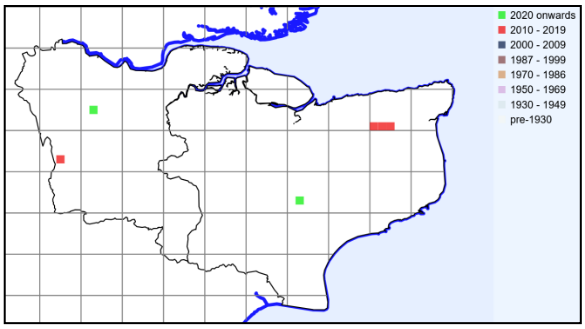


***Valeriana officinalis* Kent records to 2024 mapped at tetrad level, from BSBI database.**

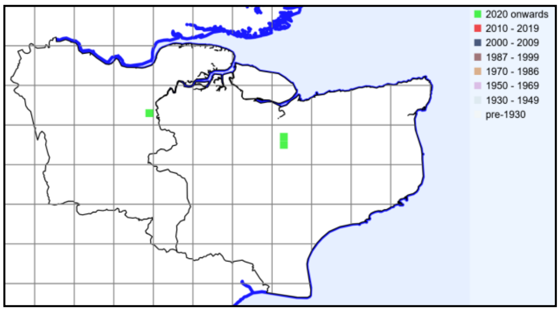
From the accompanying historic distribution map, the pattern of loss seems to be primarily Wealden, both east and west Kent, and hence relating to subsp. *sambucifolia*. While habitat loss due to drainage or scrubbing over may be expected, the extent seems greater than this explanation for decline would allow for. The older losses in north west Kent (1950s/60s) look likely to be attributable to metropolitan development.



Subsp. *sambucifolia*, Wye. Photo by Lliam Rooney, 4 July 2011

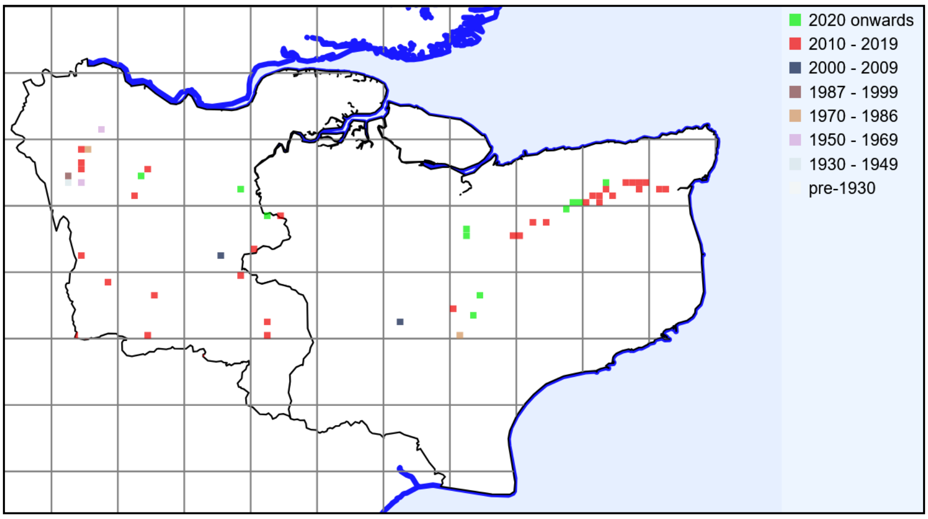


***Valeriana officinalis* subsp. *sambucifolia* Kent records to 2024 mapped at tetrad level, from BSBI database.**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

***Valeriana officinalis* subsp. *collina* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Our 2010-24 records (and a few older ones where monad recording was undertaken) are given here below at monad level, which is the basis on which this register will operate for the species. These records clearly show a concentration along the Stour; much less obvious are a few sites related to the Teise and the Darent.


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

***Valeriana officinalis* Kent records to 2024 mapped at monad level, from BSBI database.**

We have mostly noted its presence in wet habitats – marshy areas, open or shaded; by ditches; river-, stream- or pond-sides; and flushed ground at a woodland edge. Our data do not include associated species in wetland habitats; but Grime *et al.* (1988)[910] note a relationship with vegetation associated with moderately fertile and relatively undisturbed conditions.

Regeneration from wind-dispersed seed or from axillary bulbils is apparently infrequent; and regeneration, at least as regards subsp. *sambucifolia*, is mainly by stoloniferous spread, above and below ground. Stolons in subsp. *collina* are much reduced, if not absent.

Subsp. *sambucifolia*, Wye. Photo by Lliam Rooney, 4 July 2011

For the differences between this species and *Valeriana dioica*, please refer to the previous register account.

Habitat, subsp. *collina*, Crookhorn. Photo by David Steere, 19 June 2016.

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[910] Grime, J.P., Hodgson, J.G. & Hunt, R. (1988). *Comparative Plant Ecology*, Unwin Hyman, London.

Valerianella dentata (L.) Pollich (Narrow-fruited Cornsalad)

vc 15 & 16

Rarity / scarcity status

Valerianella dentata is an archaeophyte or ancient introduction of arable fields with a scattered distribution in the British Isles, absent from Scotland. Its conservation risk status in both England and Great Britain as a whole is **Endangered**, reflecting in England a comparison of data over the periods 1930-1969 and 1987-1999 which shows that its area of occupancy had declined so that there was a calculated 52% reduction in the likelihood of recording it. In Kent, there is evidence of a decline of 53% in tetrad records as between 1971-1980 and 1991-2005 (although this may overstate the losses) so that, while it is neither rare nor scarce in the county, its status is concerning. It is a Kent axiophyte and so is indicative of good habitat.

Account

Archaeological contexts provide the first evidence of the presence of *Valerianella dentata* in Kent. A late Iron Age pit and Romano-British waterhole at Ashford provided waterlogged plant material including this species; the flora was interpreted as one of wet, rough, cattle-trampled grassland.[911] Material was also identified in an occupation layer of mid- to late- second century date above hearth deposits at Springhead.[912]

Ranscombe farm. Photos by Lliam Rooney, 3 June 2010 (above) and 4 June 2010 (below)

The first Kent botanical record for this cornsalad appears to be a specimen in the Du Bois herbarium at Oxford collected by Charles du Bois (*c*.1658-1740) as 'found among corn at Chiselhurst in Kent'[913]. Edward Jacob in his *Plantae Favershamienses* (1777) identified three cornsalads, and Hanbury & Marshall (1899) regarded one of these as being as being *Valerianella dentata* (listed under *Lactuca* rather than *Valerianella,* and stated to be '*In Fields among Corn, and on old Walls* – common') but there is no certainty about this identification.

In Hanbury and Marshall's time *Valerianella dentata* was considered to be a frequent plant of fields, banks and open places in woods, especially on chalk and clay. They gave no detailed records, which may be a measure of frequency, but noted that it had not yet been reported from Thanet or Romney Marsh. Their description is a little surprising, both as regards presence in open woodland (although this may be an extension of its ability to grow as a ruderal, and we have more recent experience of this possibility) and on clay. We would think of the plant as more characteristic of chalk arable, just as Francis Rose considered it as a species of 'Cornfields on chalk; locally frequent & widely distributed in the chalk districts, not recently recorded on any other soils' (MS *Flora of Kent*).

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[911] Stevens, C.J. Waterlogged plant remains. In (n.d.) *Excavation of a multi-period site at Foster Road, Ashford, 2006 – Archive report: finds and environmental*. Wessex Archaeology. It is not clear which of the features provided the cornsalad remains.

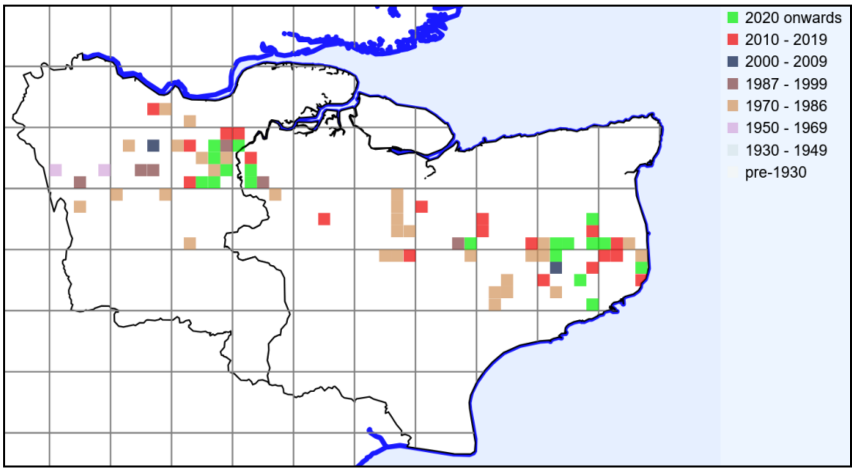
[912] Campbell, G. The charred plant remains. In (n.d.) (eds.) Boyle, A. & Early, R.. *Excavations at Springhead Roman Town, Southfleet, Kent*. OAU Occasional Paper Number 1.

[913] Druce, G.C. (1928). British Plants contained in the Du Bois Herbarium at Oxford, 1690-1723. *British Exchange Club Report for 1927*, **8**: 463-493.

Francis Rose's records from the 1940s and 50s were nearly all from cornfields; they followed the chalk across the county, from Morants Court Hill in the west to Lydden and Addisham in the east, with one anomalous habitat occurrence, in gravel pits east of Aylesford in 1956. It was still fairly widespread on the chalk, albeit local, by the time of the 1971-80 survey (Philp, 1982), which recorded it in 43 tetrads. After then (or indeed, probably in progress during the course of the survey), a steep decline took place, no doubt associated with increased application of agricultural herbicides. Philp 2010 recorded it in only 20 tetrads for 1991-2005, mostly at the edge of cornfields, but occasionally other arable fields on chalk. This may have overestimated the extent of decline, as our 2010-24 records amount to 37 tetrads (49 monads).

Ranscombe farm. Photo by Lliam Rooney, 9 June 2010

The extent of decline is mapped by the historical distribution data below, in which it will be seen that the species tracks the chalk across the county, but that there are heavy losses in West Kent where it has gone from six hectads since the 1970s, less so in East Kent, where it has gone from three hectads.



Valerianella dentata **Kent records to 2024 mapped at tetrad level, from BSBI database.**

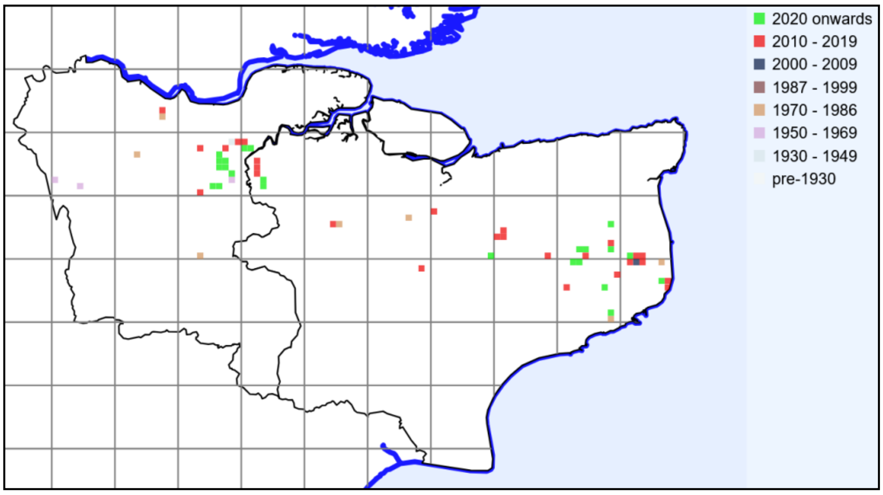
This now leaves the cornsalad as concentrated around the Medway Gap and a large area of chalk hinterland inland of Dover, which retains value for many other arable weeds as well, perhaps due to the underlying character of the chalk (here The Margate Chalk Member rather than the Seaford Chalk or Lewes Nodular Chalk Formations).

Our recent records generally relate to arable field margins, with crops noted as wheat, barley and broad beans. At Upper Halling, plants were seen in 2013 at a field margin which had been sown with a mix to encourage farmland birds; presumably its appearance reflected absence of herbicide application, given that it is not a normal seed-mix constituent. Because of the inconspicuous appearance of the species and its frequent entanglement with other weed flora, it has not always been easy to estimate population sizes, but at times this has been in thousands, e.g. at Ranscombe in 2016 there were estimates of 11,000 in TQ7067 and 18,000 in TQ7167. Even more spectacularly, the species grows in abundance on conservation margins of chalky fields at the Birling Estate east of Trottiscliffe and in 2024 (see *Kent Botany*, 2024, pp43-44) an assessment was made of its density in a 50x50cm sample plot at TQ 65532 61316, in an area where *Valerianella* cover appeared completely dominant. Ninety plants were counted, equating to 360 per square metre. An extrapolation was made for the field in which the plot lay, whose boundary ran for 0.58km. Even making allowance for such dominant cover not existing throughout the length of the field (although in some places it was dominant across a 10m width, and a 5m stretch in such a place will have held 18,000 plants), a conservative estimate produces hundreds of thousands of plants; including other fields the total must be in millions.

Conservation margin at Birling Estate dominated by *Valerianella dentata.* Photo by Geoffrey Kitchener, 13 August 2024

We have had a few sightings in anomalous, disturbed habitats. In 2012 one plant was seen at a woodland edge near Trottiscliffe; in 2017 some plants were growing on a chalky bank near Woolage where disturbed by rabbits; in 2020 a few plants were by a gateway at Lydden; and in 2021 a single fruiting plant was seen alongside a forest track at Eggringe Wood by recently-cut chestnut coppice, assumed to have been brought in on tractor tyres.

The current distribution is shown by the following map with monad records, the level of resolution at which our register records are maintained. Older records are largely absent, as monad recording only became the norm in Kent from 2010.



***Valerianella dentata* Kent records to 2024 mapped at monad level, from BSBI database.**

As regards associated plants in typical habitat on a national basis would lead us to expect any of *Aphanes arvensis* (Parsley-piert), *Buglossoides arvense* (Field Gromwell), *Chaenorhinum minus* (Small Toadflax), *Euphorbia exigua* (Dwarf Spurge), *Fumaria* spp. (Fumitory), *Kickxia elatine* (Sharp-leaved Fluellen), *Kickxia spuria* (Round-leaved Fluellen), *Legousia hybrida* (Venus's-looking-glass), *Lysimachia arvensis* (Scarlet Pimpernel), *Myosotis arvensis* (Field Forget-me-not), *Papaver* spp. (Poppy), *Sherardia arvensis* (Field Madder), *Veronica arvensis* (Wall Speedwell), *Veronica persica* (Common Field-speedwell), and *Viola arvensis* (Field Pansy).[914] The Birling Estate sample plot mentioned above had the appearance of domination by the wiry interlaced branches of *V. dentata* plants but closer examination showed *Lysimachia arvensis* (Scarlet Pimpernel); *Anisantha sterilis* (Barren Brome); *Fallopia convolvulus* (Black-bindweed); *Geranium dissectum* (Cut-leaved Crane's-bill); *Lapsana communis* (Nipplewort); *Kickxia elatine* (Sharp-leaved Fluellen); *Medicago arabica* (Spotted Medick; *Papaver rhoeas* (Common Poppy); *Plantago major* (Greater Plantain); *Sherardia arvensis* (Field Madder); *Sonchus asper* (Prickly Sow-thistle).

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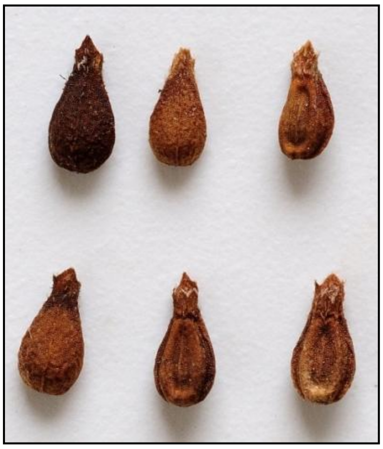
[914] Smith, A.(1994). *Valerianella dentata*(L.) Pollich narrow-fruited cornsalad. In (eds.) Stewart, A., Pearman, D.A. & Preston. C.D. *Scarce plants in Britain*, JNCC, Peterborough.

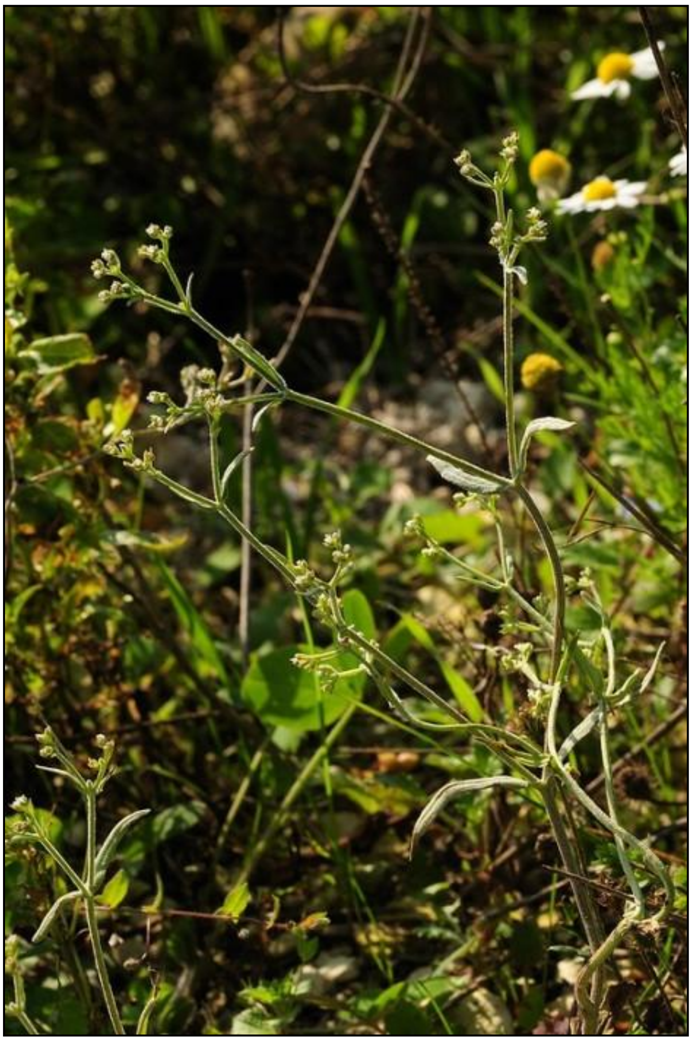
It is an annual, germinating in both spring and autumn although spring-sown crops offer it an advantage through lesser competition. Cornsalads are identified from their fruit characters and the main ones for *Valerianella dentata* are that the fruit is flat on one side, rounded on the other, and is not particularly wide; it has a distinct calyx persisting on top, not greater than 2/3 the length of the fruit; and that the tooth which surmounts the calyx is scarcely divided. *Valerianella dentata* flowers are white or pinkish (not blue-lilac as with, e.g. *Valerianella locusta*, Common Cornsalad).

The usual *Valerianella dentata* is var. *dentata,* with fruits which are glabrous, or nearly so. Hairy-fruited plants may be suspected as being *Valerianella eriocarpa* (Hairy-fruited Cornsalad), which has not been recorded in Kent since 1956. The hairy-fruited version of *V. dentata* is var. *mixta*, and is mentioned in Edward Jenner's *Flora of Tunbridge Wells* (1845), as growing in cultivated ground.



Seeds of *Valerianella dentata* var. *eriosperma*, Wouldham. Photo by Lliam Rooney, 2013

There is, however, yet another hairy-fruited variant, var. *eriosperma*, which shows a number of characters intermediate between *V. dentata* and *V. eriocarpa* (Hairy-fruited Cornsalad) - bristly seeds and a calyx with rather larger teeth than normal for *V. dentata* although considerably smaller than the "crown" of *V. eriocarpa*. This was first found in Kent by Cath Shellswell on a Plantlife survey of arable margins in 2013 near Wouldham and identified as probably this by Phil Wilson. There is also a 2015 record by Lliam Rooney at Ranscombe Farm, TQ 70710 67532. The name combination has also been made at subspecific level and the taxon is somewhat enigmatic, sometimes placed in synonymy with *V. eriocarpa* and being unrecognised by Sell & Murrell[915] at either level.



Ranscombe farm. Photo by Lliam Rooney, 9 September 2010

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[915] Sell, P. & Murrell, G. (2006). *Flora of Great Britain and Ireland*, vol. 4. Cambridge University Press, Cambridge.

Verbascum lychnitis L. (White Mullein)

vc 15 & 16

Rarity / scarcity status

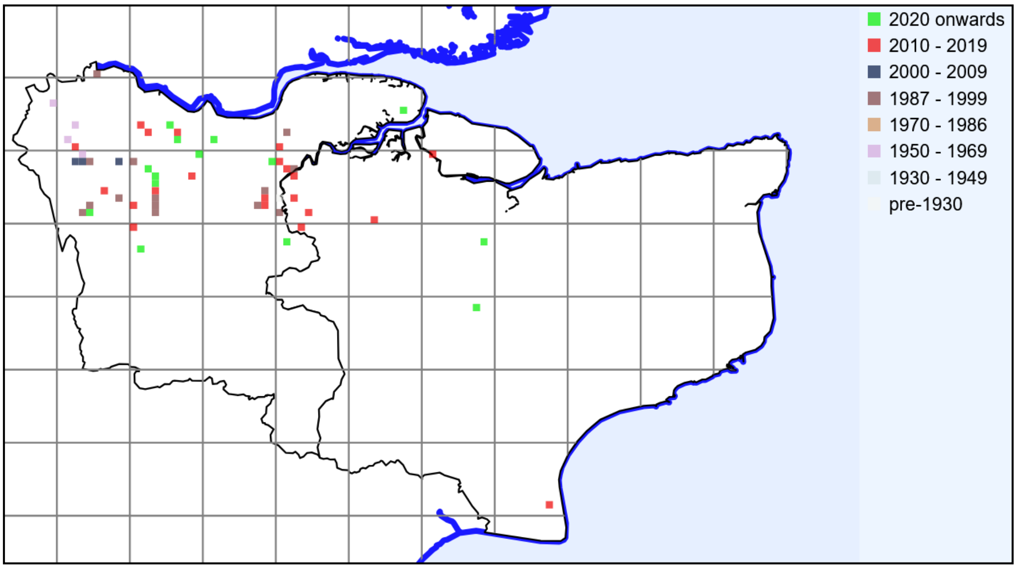
Verbascum lychnitis grows locally scattered in south England on dry, bare, usually calcareous ground, and is generally casual or an escape elsewhere. Its conservation threat status, both in England and in Great Britain as a whole, is one of least concern, although it is **nationally scarce**. It is neither rare nor scarce in Kent, but the core British populations are in north west Kent, where it is far more frequent than elsewhere, so it is here of national significance. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first record for the British Isles is, fittingly, Kentish and was published by John Gerard in his 1597 *Herball*: 'These plants do growe of themselves neere the borders of pastures, and plowed fields, causies, and drie sandy ditch bankes, and in other untilled places. They grow in great plenty neere unto a lyme kill upon the end of blacke Heath next to London, as also about the Queens house at Eltham, neere unto Dartford in Kent'. These locations were given as applicable to *Verbascum thapsus* (Great Mullein) as well as *Verbascum lychnitis.* Hanbury & Marshall (1899) regarded it as native on the chalk, a plant of banks, open copses and roadsides; not uncommon in the north-west; rare elsewhere.

Ranscombe farm. Photo by Lliam Rooney, 29 June 2011

Francis Rose assessed it as native on banks, in scrub and open woods on chalk, frequent to locally common in West Kent, scattered on the chalk from the Medway to the Stour, unrecorded on the chalk from the Stour to the coast [although this is not fully borne out by his collated records, which include Langton Bay to St. Margarets], locally frequent on tertiary sands and on imported chalk on railway banks, waste ground and quarries in north west Kent; rather rare on banks, and in old quarries on ragstone further out in West Kent; on an old railway near Horsemonden; casual elsewhere. Railway banks provided 1940s/50s records listed by him at Bickley, Elmstead Woods station, St Mary Cray, Slade Green, Chislehurst, Denton, Cuxton, Knockholt station chalk cutting, Hildenborough; presumably they provide a substrate which is maintained open and, being sandy or chalky, is well-drained.

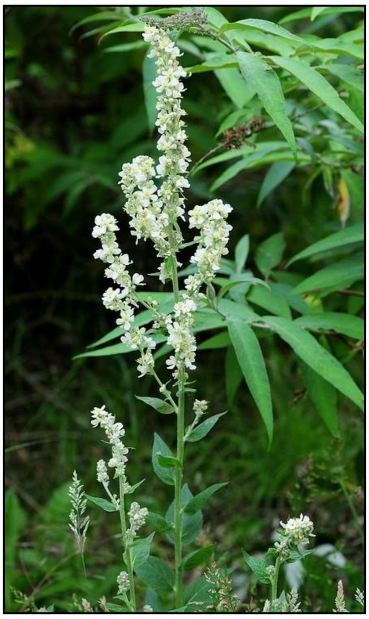


***Verbascum lychnitis* Kent records to 2024 mapped at monad level, from BSBI database.**

He listed it in 15 hectads in Kent, whereas

Philp (1982) recorded it in 12, made up from 31 tetrad records. By the time of the survey in Philp (2010), 1991-2005, this had reduced to 21 tetrads, without comment on any cause. But perhaps this was not needed, as our 2010-24 records show little diminution, amounting to 32 tetrads (35 monads), albeit that five of those tetrads were in metropolitan north west Kent and so outside the county administrative boundary to which the 1991-2005 survey was restricted.

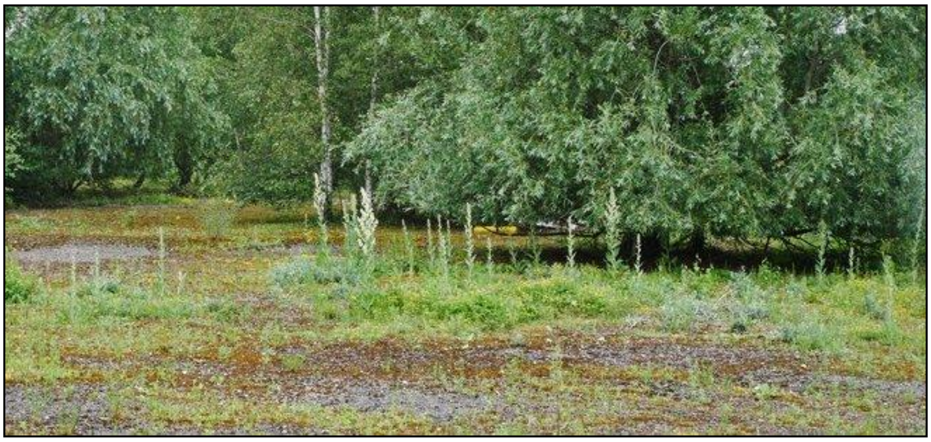
For the purposes of this register, records are maintained at monad level and are mapped above, the limited number of older records reflecting the position that recording at monad resolution only became the norm in Kent from 2010.



Recent records include finds on railway cuttings, embankments and platforms(platforms 2/3 and 4 of Elmstead Woods station in 2014); gravelly ground; chalky field margins; cleared ground; chalk banks; cindery ground over chalk; abandoned aggregate surfacing; illegally dumped soil banks; a shingle path; chalk grassland, often sloping. Population sizes vary considerably from the odd plant or two to 20-30 plants in Fawkham school grounds (2011); c.70 on newly cleared chalk slopes above Ladd's farm, Upper Halling (2013); 27 plants on thin chalky soil at Darenth (2015); and 72 flowering plants on chalky railway land at Longfield (2021).

Greatstone. Photo by Lliam Rooney, 12 July 2011

The disturbed nature of these habitats presumably reflects a need of light for germination from a persistent seed bank. *Verbascum* seeds are capable of germinating on the soil surface, even under strongly fluctuating day temperatures. They have also retained some viability after burial for a century.[916] There is some experimental evidence for *V. lychnitis* in the case of seed burial for up to four years where not only was the seed bank persistent, but germination rates rose year on year to 41%[917]. Seed production from a plant (which for many may result from flowering in two successive years, in spite of its usual biennial nature[918]) is substantial, and most seeds are presumably shaken out by the wind for medium/short distance dispersal; but about 15% appear to be retained in the capsule and are presumably only released when the stem drops and decays.[919]



Habitat, Grain. Photo by David Steere, 20 June 2021

The species is separated from other mulleins by virtue of having all its anthers reniform and mounted transversely on the white-haired filaments; having stems and leaves unevenly hairy, becoming more or less glabrous later with leaves green above; and with pedicels generally more than 6mm long. More obviously, it has white flowers, but yellow flowers are possible and not uncommon on the continent – the description by Linnaeus in naming it is based on the yellow-flowered version, the white-flowered one being treated as a variant, var. *album*. Francis Rose only knew of the yellow-flowered form in Kent as a casual at Kemsing station.

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[916] Kivilaan, A. & Bandurski, R. S. (1981., The One Hundred-Year Period for Dr. Beal's Seed Viability Experiment. *American Journal of Botany* **68**: 1290-1292.

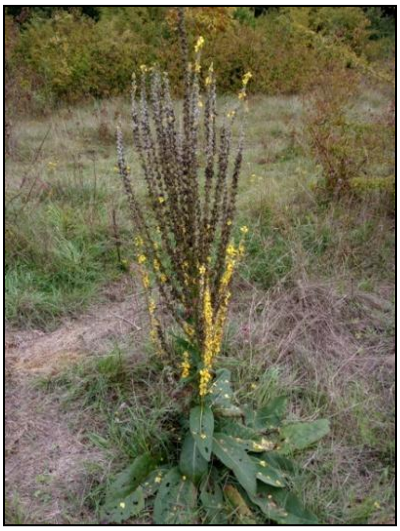
[917] Csontos, P. (1998). Seed bank behaviour of Verbascum L. species. *Studia botanica hungarica* for 1996-97, **27-28**: 117-121.

[918] Johnstone, V.A., (1994). *Verbascum lychnitis* l. White mullein. In (eds.) Stewart, A., Pearman, D.A. & Preston. C.D. *Scarce plants in Britain*, JNCC, Peterborough.

[919] Johnstone, V.A., (1981). Seed dispersal in *Verbascum lychnitis*., *B.S.B.I. News*, 59:39.

Verbascum lychnitis is capable of hybridising with *Verbascum thapsus* (Great Mullein) and with *Verbascum nigrum* (Dark Mullein). The former cross (*V*. x *thapsi*) was first recorded for the British Isles by William Hudson in his *Flora Anglica* (2nd edition, 1778), as growing in chalky and sandy meadows and pastures in Kent, although he did not recognise its hybrid character.

V. x *thapsi* was well recognised as a hybrid by Charles Darwin[920] who, having transplanted into his garden at Downe an odd-looking *Verbascum*, found growing wild in nearby Cudham valley, noted that it grew 8 feet tall and was self-sterile but could be pollinated from *V. thapsus* and *V. lychnitis*, although producing only 1-5 seeds per capsule, whereas normal *V. thapsus* carried 700. This led him to explore the field from which the plant originated, which had numerous plants of both species and 33 intermediates. The intermediates possessed the height of *V. thapsus*, but had the branching of *V. lychnitis*; often with *lychnitis*-shaped leaves but sometimes with the woolliness and decurrency of *thapsus*; with petal and anther characters closer to *lychnitis*, but the yellow petal colour of *thapsus*. He noted how readily hybridisation, presumably from bee pollination, had arisen; that the plants, being highly sterile, were presumably first-generation; and that there was considerable variation in how parental characters were reflected in each plant. We have had no post-2010 records for the cross, but Philp (2010) noted it at Shoreham, Darenth, Higham, Hollingbourne and Westwell during the period 1991-2005.



Darenth, *V.* x *incanum.* Photo by Geoffrey Kitchener, 15 September 2022.

Darenth, *V. lychnitis* and *V. nigrum,* Photo by David Steere, 13 July 2015

The cross with *Verbascum nigrum* (*V.* x *incanum*) also has a first British record from Kent, a specimen in the herbarium of Adam Buddle (d. 1715) from Charlton House. The cross has an intermediate leaf shape and pubescence, the inflorescence branching is less pronounced than in *V. lychnitis*, and it inherits yellow flowers and some purple hairs on the filaments, so that overall it appears closer to *V. nigrum*. The only recent Kent records are from Darenth, where both species grow together on thin soil over chalk with cinders and derelict surfacing from a former hospital; here it was seen for the purposes of Philp (2010) and also in 2017 and 2022.

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[920] Darwin, C. (1869). On the specific difference between *Primula veris*, Brit. Fl. (var. *officinalis* of Linn.), *P. vulgaris*, Brit. Fl. (var. *acaulis*, Linn.), and *P. elatior*, Jacq.; and on the hybrid nature of the common oxlip. With supplementary remarks on naturally produced hybrids in the genus *Verbascum. Journal of the Linnean Society* (*Botany*) **10**: 437–54.

Veronica officinalis L. (Heath Speedwell)

vc 15 & 16

Rarity / scarcity status

Veronica officinalis is widespread and common on well-drained soils, generally acid, across the British Isles. The reason for its appearance in this register is its designation in 2014 as **Near Threatened** in England, due to a comparison of data over the periods 1930-1969 and 1987-1999 which shows that its area of occupancy had declined so that there was a calculated 22% reduction in the likelihood of recording it. In Kent, it is neither rare nor scarce and the evidence of decline is fairly marginal, a 6% drop in tetrad records as between surveys of 1971-80 and 1991-2005. It is a Kent axiophyte and so is indicative of good habitat.

Goddards Green. Photo by David Steere, 13 June 2020

Account

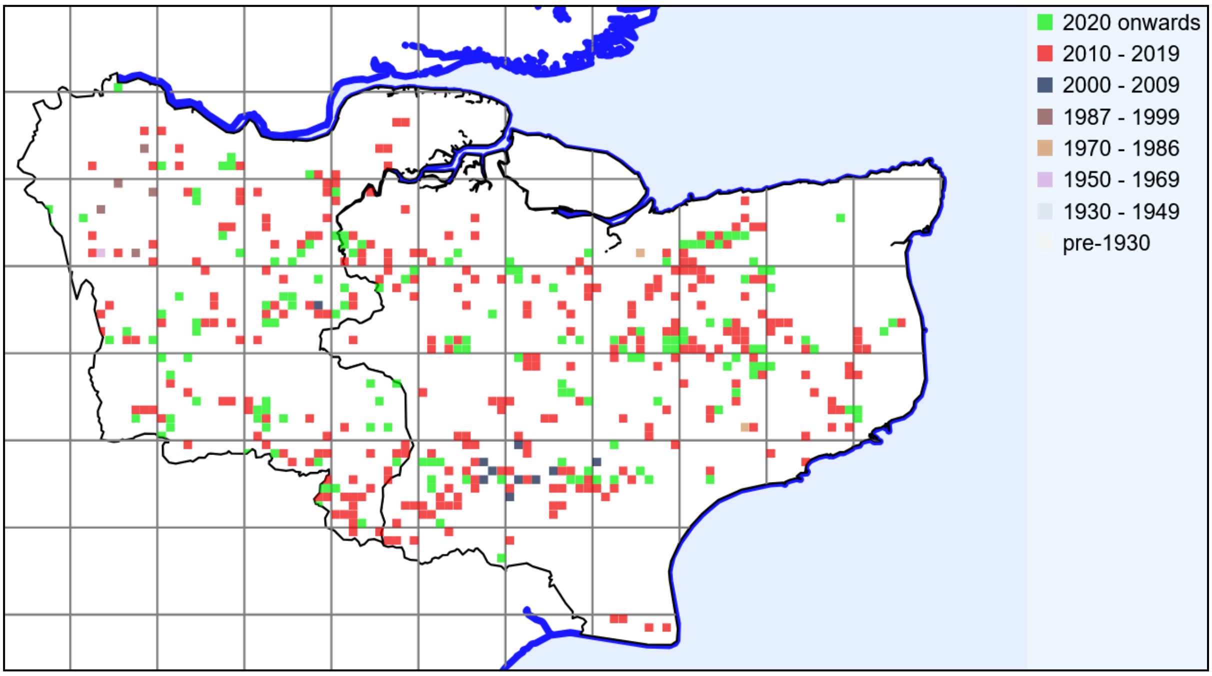
The first published Kent record is by Edward Jacob in his *Plantae Favershamienses* (1777), '*In barren dry Fields – common*'. Thomas Forster (*Flora Tonbrigensis*, 1816) considered it to be a plant growing 'in sandy pastures, heaths' &c. very common', followed up by Edward Jenner (*A Flora of Tunbridge Wells*, 1845, covering a fairly similar area) describing it as of 'Banks, and other dry situations, common'. Hanbury & Marshall (1899) found it so common that they gave no records other than Jacob's, and summed it up as a native of 'Dry woods, heaths, banks, &c.; very common, particularly on sandy soils'.

Correspondingly, Francis Rose in his manuscript *Flora of Kent* noted it as common in all wooded parts of Kent, growing in dry woodland on a variety of soils and on heaths and dry grassland; on tertiary geological deposits, on the plateau soils of the chalk districts, the greensand (where found on cherty soils) and the Low and High Weald. Where he did not find it was generally in relatively treeless districts such as Grain, Sheppey, Thanet, Romney Marsh. This is echoed by the 1971-80 survey published as Philp (1982), when recorded in 308 tetrads and more or less absent from similar areas. The 1991-2005 survey (Philp, 2010) shows a slight diminution, with 290 tetrads, and our 2010-24 records, amounting to 321 tetrads (462 monads), do not reflect this at all, showing an increase, even though nine of these tetrads are for the Greater London area, which Eric Philp did not cover.

Pembury. Photo by David Steere, 1 September 2019

Data for this species for register purposes is being maintained at monad (1km square) level, as given by the accompanying distribution map. This has been prepared from the BSBI database which shows historic records, albeit that as recording practice until relatively recent times was to record at tetrad level, then data sources such as Philp (1982) and Philp(2010) do not figure in this. It is noticeable that there are records from 2000-09 in hectads TQ83 and TQ93 which have not been re-found since. These were from a Weald and Downs Ancient Woodland Survey which is likely to have achieved more extensive access, and possibly an intensity of recording, that has not been achieved since; and there is no reason to suppose that Heath Speedwell does not continue there.

Veronica officinalis **Kent records to 2024 mapped at monad level, from BSBI database.**



Veronica officinalis is found growing both in woodland, albeit generally in rides, coppice or glades with partial shade, and in open grassland, where there may be some shading from taller vegetation; its Ellenberg light indicator value of 6 is consistent with this. Fairly low growing, with stems given as 10-40cm high (although generally at or even below the lower end of the range in open situations in Kent), it forms dense clonal mats in which the stems spread out and root. The plants formed at rooting points become independent, with the connecting stem often decaying away after the first growing season. Production of more shoots and leaves is a response to increasing precipitation and longer leaves are induced by increased temperature (at least, in Norway[921]. The species reproduces by seed as well as vegetatively, with high germination, seeds numbering an average of 16.2 per capsule, 8,700 per plant.[922]

Ruckinge, habitat. Photo by David Steere, 19 May 2019

Our Kent habitats include, as well as those mentioned above, churchyards, cemeteries, waste ground, a sand pit and golf courses. We have noted it on heathy ground but despite the name, Heath Speedwell, this does not seem to be a defining characteristic. Although it is generally regarded as a plant of acid ground, with a typical soil minimum pH of 4.5[923], it also has an extreme maximum pH of 8.1 (distinctly basic) and it is frequently encountered on chalk in Kent. For example, we have recorded it on chalk grassland at Cherry Garden Hill and Sunnyhill (near Folkestone and Dover) and at Godmersham Downs , on bare ground on chalk near Hartley and at Peter's Pit near Wouldham, where present on very thin soil over chalk at times comprising little more than a thin moss layer. Nevertheless, growth in calcareous conditions is supposed to reduce biomass production and to induce chlorosis, with iron intake being stored in a form which is not metabolically 'active'.[924]

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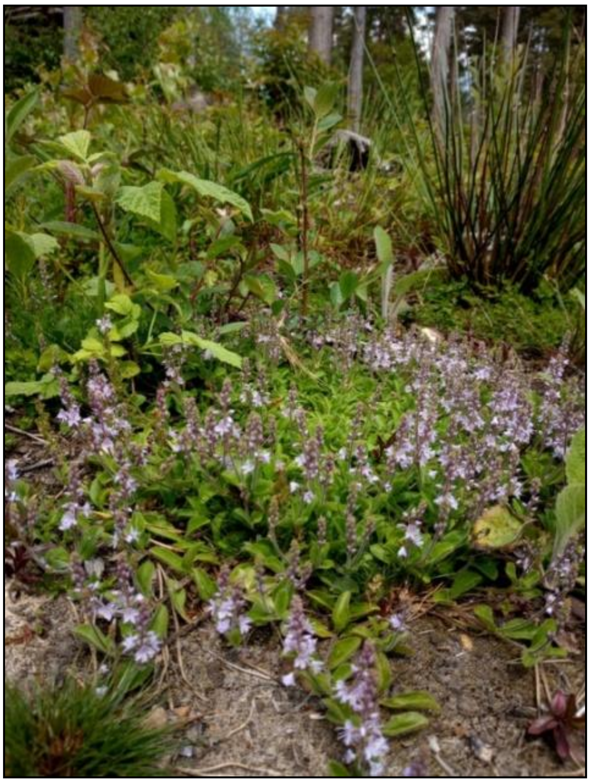
[921] Bargmann, T. (2009) How are plants responding to a changing climate? A case study of growth and allocation in *Veronica alpina*, *Viola biflora*, *Veronica officinalis* and *Viola palustris* in western Norway. MSc thesis, University of Oxford,

[922] Salisbury , E.J. (1942). *The Reproductive Capacity of Plants.* G. Bell & Sons, Ltd. London.

[923] *Ecological Flora of the Britain and Ireland*, http://ecoflora.org.uk/

It is distinguished by its racemes of pale lilac flowers arising from the leaf-axils, with flower-stalks not exceeding 2mm and being shorter than their basal bract.



Marshleyharbour Wood, Pembury, habitat (recent coppice clearance). Photo by Geoffrey Kitchener, 18 May 2023

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[924] Zohlen, A. and Tyler, G. (1997) Differences in Iron Nutrition Strategies of Two Calcifuges, *Carex pilulifera* L. and *Veronica officinalis* L. *Annals of Botany* **80** : 553–559. Zohlen, A. (2002). Chlorosis in wild plants: is it a sign of iron deficiency? *Journal of Plant Nutrition* **25**, 2205-2228.

Veronica scutellata L. (Marsh Speedwell)

vc 15 & 16

Rarity / scarcity status

Veronica scutellata is a perennial locally frequent on wet ground, bare or vegetated, across the British Isles; and in England its conservation risk assessment is **Near Threatened**, due to a comparison of data over the periods 1930-1969 and 1987-1999 which shows that its area of occupancy had declined so that there was a calculated 23% reduction in the likelihood of recording it. It is now uncommon over much of lowland Britain. In Kent, it has always been rather local and it verges on scarcity; there is very little in west Kent. It is a Kent axiophyte and so is indicative of good habitat.

Gibbin's Brook. Photo by Lliam Rooney, 30 June 2013

Account

The first published Kent record is probably[925] that by Edward Jacob in his *Plantae Favershamienses* (1777), '*In wet Ditches and marshy Ground – common*'. Other early notices were by G.E. Smith in *A Catalogue of Rare or Remarkable Phaenogamous Plants, collected in South Kent* (1829) where he gave a series of occurrences: a wood near Sandling Lodge, seen by William Hutchinson, one of Smith's subscribers; on the shore of the Baptists pond at Braybourn Leas (where he also recorded *Littorella uniflora*, Shoreweed); at Willesboro' Leas; and Ham Ponds (then 'a black, *grassy* morass'). The Leas or Lees place-names follow the sands of the Folkestone Formation, and there are subsequent records for wet areas in east Kent with similar geology. Hanbury & Marshall (1899) regarded it as a rather rare native of swampy ground, citing records which include Hothfield and Dungeness, at both of which it is still known.

Francis Rose, writing in the 1950s/60s, considered it to be a native of fens, base-rich flushes in valley bogs, ponds and marsh dykes, more restricted to peat than *Veronica anagallis-aquatica* (Blue Water-speedwell) and *Veronica catenata* (Pink Water-speedwell), widespread although rare in Kent and decreasing with the drainage of bogs and fens. He noted it as having been present in 13 hectads in the county. This had become 8 hectads by the time of Philp (1982), with the species being recorded during 1971-80 in nine tetrads, generally at the edge of ponds and in swampy ground. Philp (2010) shows no decline for 1991-2005, *Veronica scutellata* being recorded in ten hectads, 13 tetrads. Since then, the numbers of records have increased, with plant being given by the BSBI database for 21 tetrads (equivalent to 12 hectads, 23 monads) in the period 2010-24. It is doubtful that there has been habitat improvement – the species is still being found in broadly the same areas as before, albeit much less so in west Kent, so presumably the differences as between survey periods largely reflect the manner of recording.

In view of the frequency of recent records, the register data for this species will be maintained at monad level, as shown by the accompanying distribution map. This shows clearly how records run along the east Kent Folkestone Formation as well as the weald clay to the south. Older records are generally not represented at monad resolution, as recording at tetrad level was the norm in Kent between 1970 and 2010.

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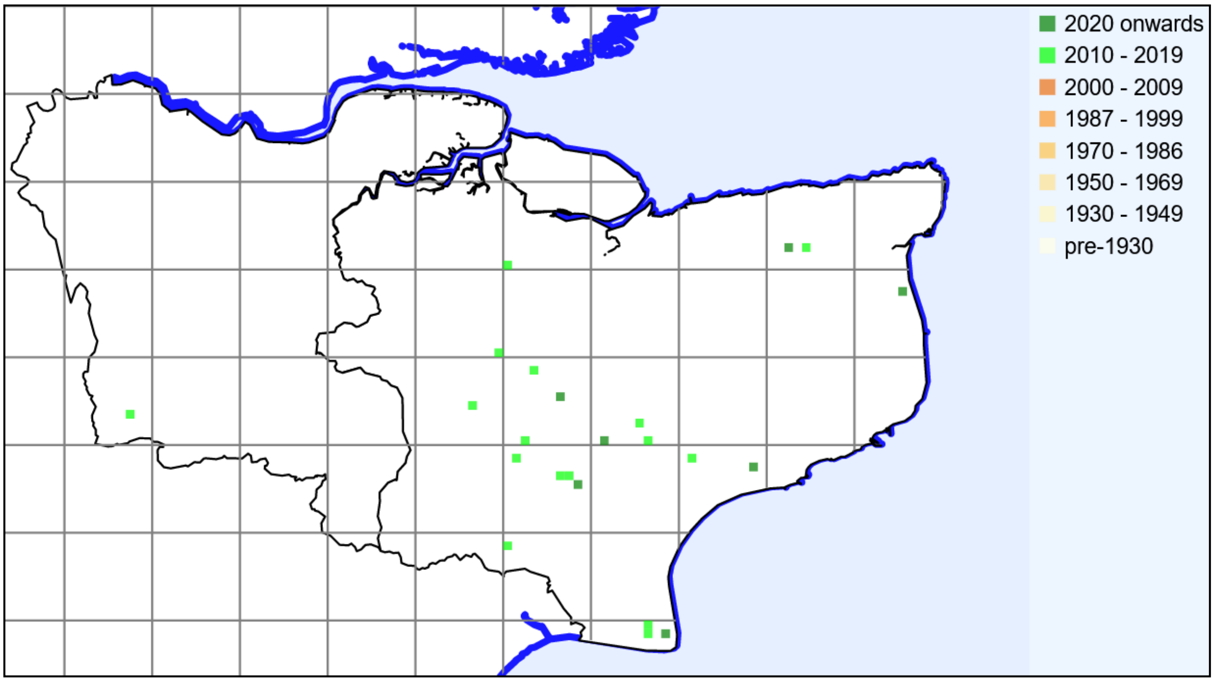
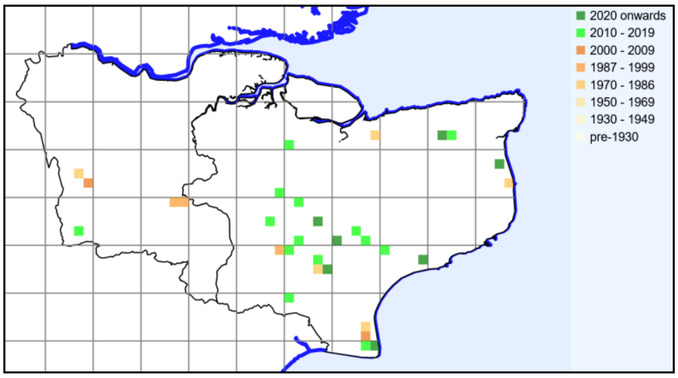
[925] An alternative candidate is Thomas Johnson's *Iter Plantarum* (1629) which gives two water-loving Veronicas as found in the marshes at Erith. These may have been *Veronica beccabunga* (Brooklime) and *Veronica anagallis-aquatica* (Blue Water-speedwell) but if not, then (as Francis Rose suggested in the 1972 edition of the *Iter*) the pair could have been *V. anagallis-aquatica* and *V. scutellata*, although Rose somewhat undermined his case by interpreting elsewhere as *Veronica anagallis-aquatica* the same Latin polynomial as he attributed to *Veronica scutellata.*

***Veronica scutellata* Kent records to 2024 mapped at monad level, from BSBI database.**


2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

However, In view of the scarcity of recent west Kent records, historic mapping at tetrad level is given below and current and older 'missing' records from vc16 are set out in a separate data table, to encourage re-finding.

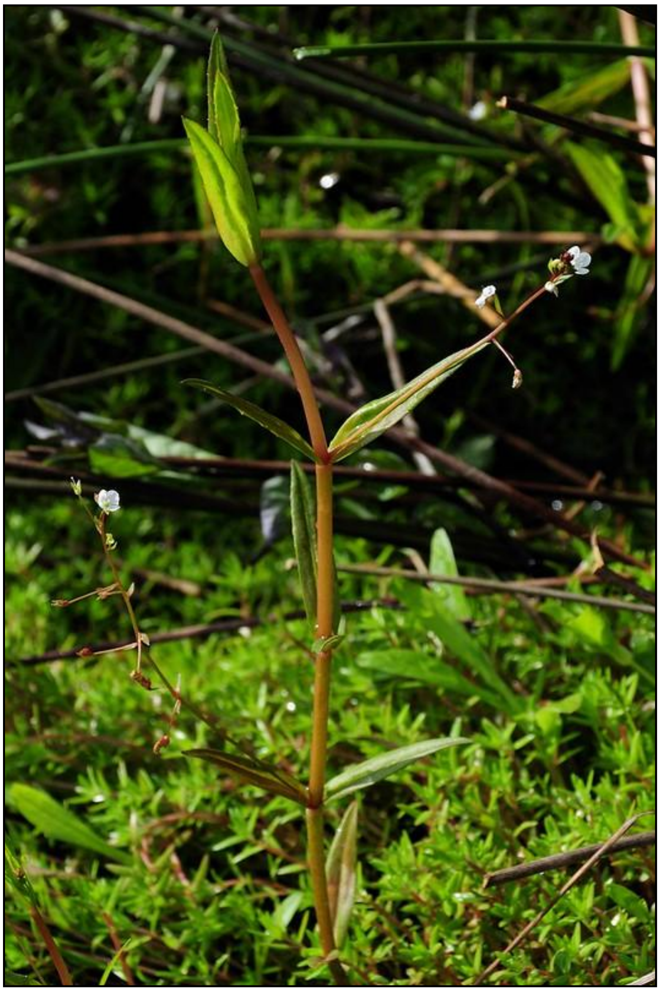

2020 onwards
2010 - 2019
2000 - 2009
1987 - 1999
1970 - 1986
1950 - 1969
1930 - 1949
pre-1930

***Veronica scutellata* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Post-1970 sites for West Kent (vc16) only					
West Kent Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Markbeech north	TQ4743		6 July 2011	JP	
Brasted	TQ45S		After 1970, before 1981	Philp (1982)	May bear a relationship with a 1955 record by FR 1 mile east of Westerham, which RAC considered to be probably in a swampy field west of Church Lane, Brasted – this field was herbicided in 2019.
Goathurst Common	TQ45W		30 May 2003	EGP & PH	
East Peckham	TQ64U		1991-99	EGP	
Laddingford	TQ64Z		1991-99	EGP	

Our recent records have tended to be at pond margins, sometimes in or at the edge of woodlands, sometimes in open fields and there is also a long-persistent pond presence at the Dungeness freshwater Pits on shingle; also in generally marshy ground and in bogland at Hothfield Heath, where known since Victorian times. Its association with wet, generally infertile soils has rendered it prone to habitat loss or damage through eutrophication, lack of grazing and land drainage.

Veronica scutellata is distinguished from other speedwells of wet habitats by virtue of its fairly few-flowered racemes emerging from one side only of the paired axils of opposite leaves; the norm for other such species is that the racemes are in opposite pairs. The usual form (var. *scutellata*) has glabrous stems, inflorescence and leaves, but in relatively drier habitats a hairy plant may be encountered (var. *villosa*); there is mention of this (as forma *parmularia*, growing with the normal form) by A.G. More at Camden Park, Tunbridge Wells in 1855.[926]



Gibbin's Brook. Photo by Lliam Rooney, 30 June 2013

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[926] More, A.G. (1855) *On some Uncommon Plants observed at and near to* Tunbridge Wells, Kent, *in* 1855. *Phytologist* N.S. **1**: 292-295.

Vicia bithynica (L.) L. (Bithynian Vetch)

vc 15 & 16

Rarity / scarcity status

Bithynian Vetch is an uncommon annual, mostly found in coastal areas of south England, although with a limited Welsh presence and barely reaching Scotland. In Great Britain as a whole it is considered **Vulnerable** to the risk of extinction. In England, however, its threat risk assessment is one of 'Least Concern', although this is based on 1930-99 data, and if 1987+ data had been assessed as a proportion of all data, including before 1930, then a concerning 58% decline would have been detected. It is **nationally scarce**, although there are issues as regards the extent to which populations may be regarded as native and how far transience may be treated as evidence of decline or introduction. In Kent, it would appear from Philp (2010) to be rare, but subsequent records suggest that it is not quite so infrequent, but still very scarce.

Account

The first published Kent record[927] is of a find by Professor John Stevens Henslow, from Frindsbury, presumably represented by a specimen in Manchester Museum dated 26 June 1827 (material appears to have been present in other herbaria as well). There is another early record near the tidal Medway, published in 1837 as 'near the tunnel at Hoo [the Higham and Strood tunnel belonging to the South Eastern Railway Company], about three miles further along the river, in copses. (Mr. Borrer.)'. It was at Greenhithe in 1860 (specimen at **MNE**). The tendency of nineteenth century records was, except for a report from Darenth Wood (which may relate to adjoining Watling Street, rather than a fully woodland habitat) to exhibit a coastal or estuarine distribution, with Hanbury & Marshall (1899) describing it as a rare native of bushy places, banks by the sea, with a presence including Deal and Folkestone.

Warden. Photo by Lliam Rooney, 18 June 2013

East coast sightings do not appear to have persisted from 1953 or thereabouts. On the other hand, a fairly diffuse distribution has continued around the Medway estuary, including Sheppey and the Swale estuary, and in the Greenhithe-Swanscombe area, to which the early Darenth Wood record may be related.

Whether there was continuity at Greenhithe from1860 up to the recording in 1974-75 by John Palmer of ten plants by the Thames (reduced to one in 1977) is an open question. He also recorded it in 1977 as plentiful in a copse at Springhead, and a scattering of records in the Springhead area has continued to be reported (2015-21). Nearer the estuary, in scrubbing grassland at Swanscombe peninsula, it has been recorded in quantity, with data emerging from surveys carried out (2015) in connection with the then proposed London Resort development: scattered populations (tens to hundreds of plants) were found throughout the peninsula, but larger colonies (hundreds to thousands) were present at Broadness and the seawall to the west of the peninsula.

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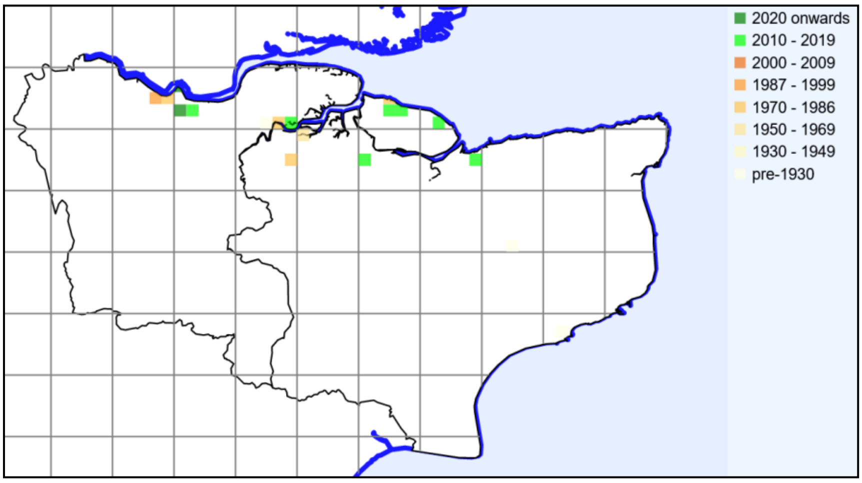
[927] Given by Hanbury and Marshall (1899) as in Hooker & Arnott's *British flora*, edition 1, 1835. However, this work was a successor to William Jackson Hooker's *British Flora* of 1830, which carried similar information.

Around the Medway/Swale area, Philp (1982) recorded it in five widespread tetrads, reduced to three in Philp (2010) at Stone, Minster and Warden. At Minster it was known to Francis Rose from 1946 at least to 1963, in scrub on London Clay cliffs near "Royal Oak", East End (a public house that closed in the 1950s and succumbed to cliff erosion afterwards). Plants, however, survive (2019) at both the top and bottom of the cliffs. At the clay cliffs of Warden, it has been recorded since the 1990s, a relatively late date, although noted in 2010 as flourishing along some 90m of slumping clay cliffs, whose movement opens up bare ground for annual germination and keeps scrub encroachment at bay.

Warden. Photo by Lliam Rooney, 18 June 2013

The apparent decline between the Kent surveys of 1971-80 and 1991-2005 has not been borne out by recent records which, with presence in nine tetrads (ten monads) noted during 2010-24, considerably exceed those from the earlier surveys. Trends are not easy to interpret with what appears to be a fairly mobile species within its general areas of occurrence, and Alex Lockton has suggested[928] that its Vulnerable status for conservation purposes is influenced by its impersistence, so that it appears in decline even though it may be arising afresh elsewhere. Testing this against BSBI database tetrad records for Kent (which do not include all the records mentioned in this account), these at August 2022 comprised 15 tetrads for the periods after 1950 (BSBI records are assembled into different date classes or recording periods, see map below). As a measure of impersistence, out of these tetrads, six (TQ57S Stone/Greenhithe, TQ67B Springhead, TQ76D Swanscombe peninsula, TQ96C Sittingbourne, TQ97R Minster and TR07 Warden) represent locations for which there are sightings in more than one date class.



Vicia bithynica **Kent records to 2024 mapped at tetrad level, from BSBI database.**

This raises the issue of how *Vicia bithynica* gets around and how far it may be regarded as native (both in Kent and generally). The general consensus appears to be that if it is native[929] in Great Britain, then it is as a plant of coastal grassland such as at undercliffs, often on clay. This habitat description would fit the Sheppey sites. It may also fit the original Upnor/Frindsbury site(s); and although Borrer's reference to the Hoo railway tunnel might suggest a relationship with railway land, this is not necessarily the case, and later records along this stretch of tidal estuary include a clay bank (probably Lambeth Group clay) by the Medway below Cockham

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[928] Lockton, A. (2021). Review of the status of *Lathyrus aphaca* and *Vicia bithynica*. Unpublished report.

[929] Described as 'Possibly native' in Stace's *New Flora of the British Isles* (4th edition), a change from 'Probably native 'in editions 1 to 3.

Wood, Upnor (1959-60), and by the sea wall at Hoo St Werburgh on London Clay (2018)[930]. A Seasalter/Whitstable find in 2018 on a London Clay grassy coastal slope owned by the Granvill Cliff Estate Company on behalf of neighbouring residential estates is somewhat recent to be accredited as native, but the habitat is appropriate.

Springhead. Photo by Lliam Rooney, 4 June 2015

The status of inland sites is more problematic. It may at times be introduced as a contaminant of legume crops or seed mixes intended to promote a legume and herb rich sward. Introduction with grass seed was considered probable for an abundance of *Vicia bithynica* around playing fields north of Highfield Road, Crockenhill in 1984. It was also considered a possibility for its 2008 discovery on the southern verge of the A2 near Springhead. It is, however, possible to view this last discovery in the context of older records in the Springhead area mentioned above, and subject to the potential for transfer of seed in the course of roadworks or other soil movement. Indeed, it is possible to trace a degree of association with transport corridors[931] more generally.

Pepper Hills. Photo by
David Steere, 19 May 2016

Vicia bithynica is an annual, claimed to germinate usually in early spring and to flower in autumn[932]. This statement seems to originate from old records in the Bristol area, and recent Somerset records show a range of flowering which includes late autumn. However, in Kent the norm is May-June flowering, with plants drying up in July. This does not seem compatible with germination in early spring, in the light of studies indicating that 5-6 months is required from germination to first flowering (with 55 days following for achieving full maturity).[933] Seed dispersal takes place on the shattering of the pod and, as the seed is relatively heavy, at 0.0522gms - cf. *Vicia* (*Ervilia*) *hirsuta* at 0.008gms[934] - it is unlikely to spread far in the absence of soil movement/disturbance.

An association with other uncommon legumes has been noted[935], e.g. *Lathyrus aphaca* (Yellow Vetchling), *Lathyrus nissolia* (Grass Vetchling), *Lathyrus sylvestris* (Narrow-leaved Everlasting-pea) and *Vicia lutea* (Yellow-vetch). All these except the last are recorded with *Vicia bithynica* on the Swanscombe peninsula, where it also grows in areas frequented by *Lathyrus hirsutus* (Hairy Vetchling); both of these species also grow at Warden, Sheppey.

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[930] This group of records did not result in inclusion above amongst the tetrads with records in more than one date class, partly due to spread over more than one tetrad and partly because the BSBI database does not cover all records.

[931] Lockton, A. (2021), op. cit.

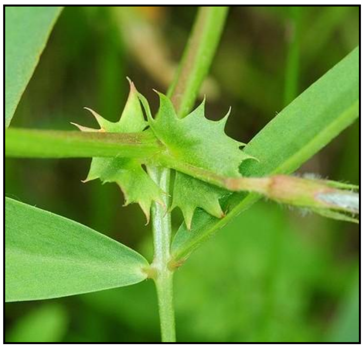
[932] Pearman, D.A. (1994). *Vicia bithyinia* (L.) L. Bithynian vetch. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. (1994). *Scarce Plants in Britain.* JNCC, Peterborough.

[933] Fu, S.M., Hampton, J.G. & Forde, M.B. (1996). Identification and seed multiplication of a collection of *Vicia* and *Lathyrus* from southwest Europe. *New Zealand Journal of Agricultural Research* **39:** 185-193.
The experimental data derived from unheated greenhouse cultivation in New Zealand, using *V. bithynica* seed from Italy, and external sand-frame cultivation added a further month to the period until flowering.

[934] Data from Fu, S.M. *et al.*, cited above.

[935] Pearman, D.A. (1994), cited above.

Warden. Photo by Lliam Rooney, 18 June 2013



Vicia bithynica is unlikely to be confused with other species except, perhaps, for *Lathyrus hirsutus*. Both have hairy pods, but the latter's flowers have a lilac-purple standard, not crimson-purple as with *V. bithynica*. Also, the stipules of *L. hirsutus* are thin and narrow; those of *V. bithynica* are large, wide and with spreading teeth (see photo).

Site	Grid reference	Site status	Last record date	Recorder	Comments
Crockenhill	TQ5066		(1) 2 June 1984 (2) 1 June 1984	(1) JRP (2) SPi	(1) TQ507666, around playing fields north of Highcroft Hall, probably introduced with grass seed (also seen, JP, 'a splendid sight'). (2) Many in newly sown grass.
Cray river levels (metropolitan vc16)	TQ57C		29 June 1997	JRP	About 100 plants, with other peaflowers.
Stone/Greenhithe	TQ57S		(1) 1991-99 (2) After 1970, before 1981 (3) 27 July 1975	(1) EGP (2) Philp (1982) (3) JRP	(1) & (2) TQ57S. (3) TQ57X, extending into TQ57S, according to Flora of the London area (Burton, 1983): found near river by JRP 1074; noted at 1975 BSBI field meeting, and only one left by 1977 (JRP). [Presumably the same record as in Philp, 1982.]
Greenhithe	TQ57X, includes TQ5975.	SSSI	(1) May-June 2015 (2) After 1970, before 1981	(1) CBA (2) Philp (1982)	(1) (a) TQ 5980 7567 to TQ 5992 7570, map references extrapolated from map in Annex EDP14 to Phase1 and Botanical Survey Report, The London Resort Ecology Baseline Report Appendix 12.1. (b) TQ 5999 7575 north-eastwards into next monad/tetrad (same source, and see TQ67D below). (2) TQ57X (and see under TQ57S].
Springhead	TQ67B, includes TQ6172, TQ6173	SSSI	(1) 15 June 2024 (2) 10 June 2021 (2) 4 June 2015 (3) 10 May 2008 (4) After 1970, before 1981 (5) 29 June 1977	(1) AL & WW (2) AL (2) GK & LR (3) GK (4) Philp (1982) (5) JRP	(1) TQ 6105 7394 and TQ 6106 7392, Northfleet Landfill. (2) TQ 6106 7394, small patch on landfill site. (2) (a) TQ 61572 72611 and south eastwards for 27m, scattered along grassland between footway and A2. Not quite the same location as the 2008 record below, which was a similar habitat but nearer the carriageway. (b) TQ 6166 7337, in rough vegetation by path. (c) TQ 6167 7321, plants scattered over 19x2m grassland east of high speed rail link. (3) TQ 6151 7262 and vicinity, numerous plants on grassy banks of southern side of A2, perhaps derived from legume sowing. (4) TQ67B. (5) Springhead, plentiful in a copse,

					TQ67B, conf. EGP [may be identical to preceding record].
Swanscombe Broadness	TQ67C, includes TQ6075	SSSI	(1) May-June 2015	(1) CBA	(1) (a) From TQ 5999 7575 (see TQ57X above) to TQ 6004 7588. (b) Broadness west of Gill Aggregates, an area 60 x 165m in both TQ6076 and TQ6075 mapped in Botanical Survey report (see above). (c) landway along north side of Botany Marsh East and West, TQ 6080 7583 to TQ 6103 7581, map references extrapolated from map in Botanical Survey Report (see above). (d) TQ 6104 7574 to TQ 6103 7560, linear presence at Botany Marsh East, map references extrapolated from map in Botanical Survey Report (see above).
Swanscombe Broadness	TQ67D, includes TQ6076	SSSI	(1) 13 July 2022 (2) 5 June 2017 (3) May-June 2015	(1) GK (2) DC (3) CBA	(1) TQ 608 760 and vicinity, scattered in scrubbing calcareous grassland by path, dried-up. (2) TQ 603 763. (3) Broadness north and west of Gill Aggregates depot, west being an area 60 x 165m in both TQ6076 and TQ6075 mapped in Botanical Survey report (see above).
Pepper Hills	TQ6272		19 May 2016	DS	TQ 62145 72115, by slip road to A2.
Hempstead	TQ76X		After 1970, before 1981	Philp (1982)	TQ76X
Upnor/Hoo	TQ77Q		After 1970, before 1981	Philp (1982)	TQ77Q
Hoo St Werburgh	TQ7971		8 June 2018	SP & DG	TQ7937 7170, bank of tidal Medway.
North Sittingbourne	TQ96C		(1) 21 May 2017 (2) After 1970, before 1981	(1) DC (2) Philp (1982)	(1) TQ 917 657, two large patches below bank on north side of main road. [N.B. Not far from 2004 report at TQ 915 655, for which confirmation would be helpful.] (2) TQ96C
Minster (Sheppey)	TQ9573		26 June 2019	SB & LR	Alongside a path at the top of clay cliffs at TQ 9576 7347.
Minster (Sheppey)	TQ97M		After 1970, before 1981	Philp (1982)	TQ97M
Minster, East End (Sheppey)	TQ97R, includes TQ9673		(1) 26 June 2019 (2) 24 June 2001 (3) After 1970, before 1981 (4) 30 July 1977	(1) SB & LR (2) EGP (3) Philp (1982) (4) JB	(1) Large patch of fruiting plants at TQ 96263 73453 at foot of clay cliff. (2) TQ97R. (3) TQ97R. [May be the same record as the next.] (4) TQ 967 733, Royal Oak Point, in a small protected valley to the west of the approach road.
Warden	TR07F, includes TR0271		(1) 18 June 2013 (2) 5 August 2010 (3) 26 June 2004 (4) 1991-99	(1) JA (2 GK (3) DM, FB (4) EGP	(1) TR 02317 71882, scrambling in grassland above Warden Bay. (2) Scattered, dried up, on slumping grassy cliffs of Thames Group Clay, from south east to north west TR 02344 71838 to TR 02283 71907 (i.e. c.90m), with an outlier at TR 02279 71921, and max extent top to bottom TR 02280 71894 to TR02301 71912. Not present on more mobile parts of

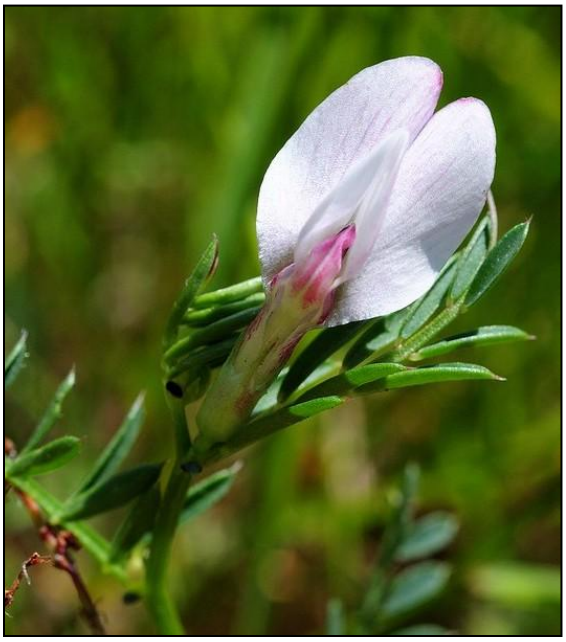
					cliff, but movement probably keeps scrub from encroaching. (3) TR 0244 7191. (4) TR07F.
Seasalter	TR0865, TR0965		(1) 18 June 2023 (2) 13 May 2018	(1) C0 (2) LR	(1) TR0865. Two patches on coastal grass slope west end of private estate. (2) A well established mass of plants on a seaside bank below Preston Parade. TR 08505 65120 to TR 08422 65103.

Vicia lutea L. (Yellow-vetch)

vc 15, apparently gone from vc 16

Rarity / scarcity status

Vicia lutea is a mainly coastal species in Britain, most frequent in the south, but also occurs inland, generally on a casual basis. It is **nationally scarce** and its conservation risk status in Great Britain is **Near Threatened**. However, in England it is considered **Vulnerable** to the risk of extinction. This arises from a comparison of English data over the periods 1930-1969 and 1987-1999 which shows that its area of occupancy had declined so that there was a calculated 42% reduction in the likelihood of recording the species. In Kent, it is now limited to Dungeness where its range has also diminished and it is **rare**.

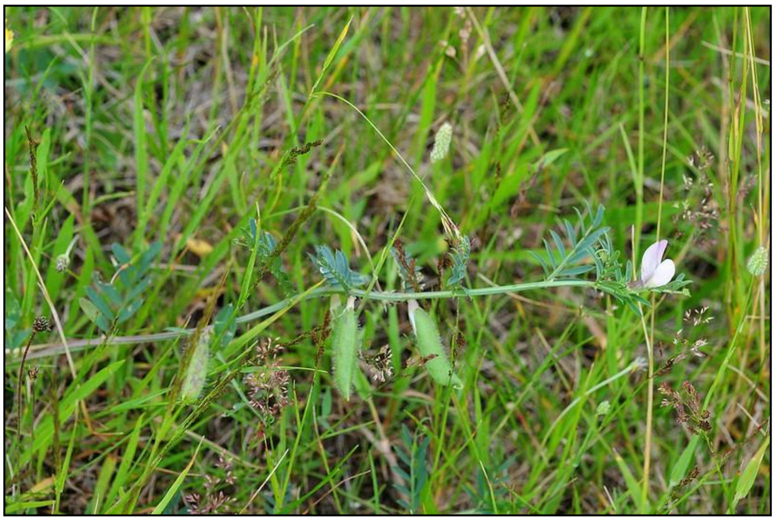


Dungeness. Photo by Lliam Rooney, 20 June 2012

Account

The first published record of this species is given by Hanbury & Marshall (1899) as in 1873, referring to an entry' in H.C. Watson's *Topographical Botany* ('Kent east. Jeffrey.'). This begs the question as to whether the record was made in 1873, or this was the date of publication. The first edition of *Topographical Botany* (vol.1) was published in 1873, but actually the entry did not appear until the second, 1883. Hanbury and Marshall (at least one of whom saw the plant here) described W.R. Jeffrey's find as 'Shingle near the Brooks, Dungeness'. This accordingly begins a tradition of records from the area which continues until now.

Dungeness. Photo by Lliam Rooney, 27 June 2012

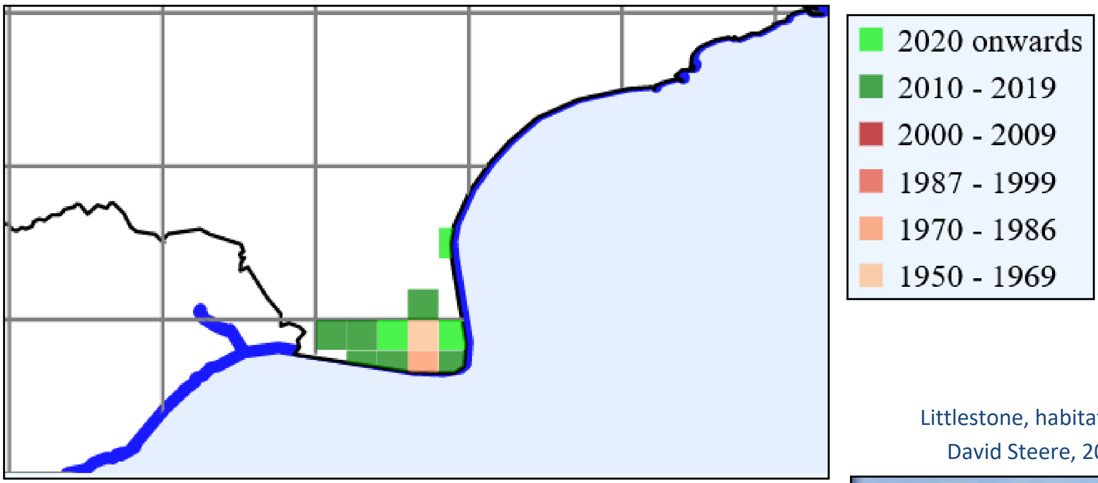


Francis Rose considered it to be native, on shingle and shell-sand beaches, very rare, although locally common around Dungeness. In his manuscript *Flora of Kent* he originally wrote up the species as having two forms, one native and the other alien, but he later referred the alien records to *Vicia pannonica* (Hungarian Vetch), distinguishing the native species as 'an almost glabrous, more or less prostrate plant with linear leaflets and cream-coloured flowers which become pale rose-tinted as they fade'. This left native records as comprising (as well as Dungeness) first, the south beach of Grain (where Rose found it in 1955; the beach has become less suitable since) and secondly, Lydd (which may be regarded as an extension of occurrence at Dungeness and was known there by George Dowker in the nineteenth century).

If one regards all other occurrences as being really *Vicia pannonica* (which may well not always be the case), then one is faced with Eric Philp having accepted as *Vicia lutea* (in Philp, 1982) three records which do not appear native. These presumed introductions comprise: a clay bank near Rainham[936]; disused allotments near South Darenth and an adventive near Tonbridge. The native records at Dungeness then, as surveyed over 1971-80, covered nine tetrads. But for the period 1991-2005 Philp (2010) provided only one tetrad record there, suggesting a catastrophic decline.

This, however, is not supported by subsequent recording, as will be seen from the map below. This depicts eleven Dungeness tetrads (including Littlestone as an outlier) as having records since the 1950s/60s, of which nine show presence since 2010. Curiously, the two tetrads which lack confirmation of recent finding are central to the overall distribution. It is not as though they comprise land difficult to access: TR01U includes some of the RSPB reserve, Boulderwall Farm and Halfway Bush with Dungeness Road running through; TR01T lies to the south and includes Pen Bars and part of the surrounds of the nuclear power station complex. Targeted recording for these areas may supply an answer.

Dungeness *Vicia lutea* tetrad records to 2024, from BSBI database



Littlestone, habitat. Photo by David Steere, 20 May 2017

The alien records are frequent in north west Kent from the 1970s to the 1990s, reflecting in particular the interest taken by John Palmer, but also may indicate the sort of seed mixes being sown at the time for amenity and roadside purposes. In several places *Vicia lutea* was suspected to be a grass seed contaminant, but it could well be that in some cases legumes were included deliberately as nitrogen fixers without too much attention being given to the species. However, in Kent the standard mixes for trunk and grant-aided principal roads included white clover as the only legume; and for chalk cuttings on non-grant-aided roads the specified legumes comprised white clover, red clover, sainfoin, kidney vetch and bird's-foot trefoil.[937]

Vicia lutea is an annual, automatically self-fertilising, which germinates in autumn and flowers in the following June. In common with many other annuals, it is capable of considerable population fluctuations from year to year with potential for particular abundance in a year following hot summer drought when competitive perennial species have been killed off.[938] The seeds are relatively heavy for *Vicia*, at 0.144 gms[939], which may limit dispersal, although presumably the plant as a whole, once fruited and dried out, would be capable of being carried by wind across the shingle. Our Dungeness records are generally on sparsely vegetated consolidated shingle; references to short grassland, disturbed or otherwise, probably amount to the same type of habitat. The shingle presumably provides a degree of openness which facilitates germination and development; it has been mentioned that plants on shingle can produce a few flowers underground[940].

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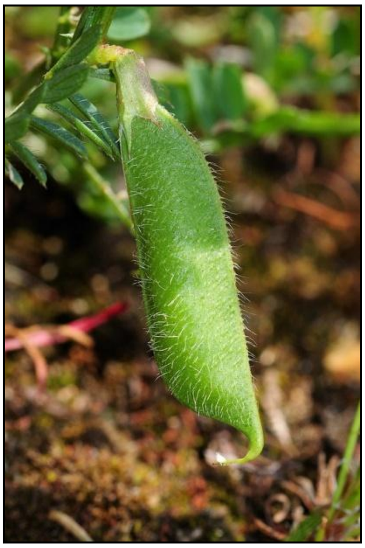
[936] Given in Philp (1982) as TQ86B, but corrected by Eric Philp on his file cards to TQ86E. This is presumably the same as a site at Horrid Hill discovered by W.C.R. Watson in 1951 and known to Francis Rose at least until 1961, regarded by him latterly as *V. pannonica*. Note that Philp (1982) is also in error in giving TR01U, which should have been TR01T.

[937] Way, J.M. (1973). *Road Verges on Rural Roads: Management and other factors*. Monks Wood Experimental Station Occasional Report No.1, Huntingdon.

It is tempting to suppose that any yellow-flowered vetch is Yellow-vetch, and that Yellow-vetch is always yellow-flowered, but neither of these propositions is true. *Vicia hybrida* (Hairy Yellow-vetch) from southern Europe has an old Kent record; its standard is hairy on the back (glabrous in *Vicia lutea*). *Vicia pannonica* (Hungarian Vetch) may similarly be distinguished and its flower colour is dirty brownish-yellow. *Vicia lutea* flowers change colour in the course of development, Francis Rose describing this as 'pinky-white fading to pale greyish-yellow'. The potential for colour variation is greater than this, if one looks beyond *V. lutea* subsp. *lutea*, the usual British plant. *V. lutea* subsp. *vestita* (= *V. lutea* var. *hirta*) generally has pinkish to purple corollas and has been claimed from Kent in 1984 near Swanley. This record has been doubted by Verloove (2021)[941], apparently on the grounds that it has not yet been confirmed from Belgium and that the *Flora Europaea* key, if used, can produce errors in that reddish (rather than whitish) hairs on the pods are in themselves not fully diagnostic of subsp. v*estita*. However, is not clear that determination was based on *Flora Europaea*, and a further record, from Crayford, was made in 1993.



Dungeness. Photo by Lliam Rooney, 20 June 2012

Dungeness. Photo by Lliam Rooney, 22 June 2014

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[938] Preston, C.D. (1994). *Vicia lutea* L. Yellow-vetch. In (eds.) Stewart, A., Pearman, D.A. & Preston. C.D. *Scarce plants in Britain*, JNCC, Peterborough.

[939] Fu, S.M., Hampton, J.G. & Forde, M.B. (1996). Identification and seed multiplication of a collection of *Vicia* and *Lathyrus* from southwest Europe. *New Zealand Journal of Agricultural Researc*h **39:** 185-193.

[940] Preston, C.D. (1994). Op. cit.

[941] Verloove, F. (2021). Vicia lutea, in Manual of the Alien Plants of Belgium, https://alienplantsbelgium.myspecies.info/content/vicia-lutea

Site	Grid reference	Site status	Last record date	Recorder	Comments
Woolwich Common (metropolitan vc16)	TQ47I		1984	JRP	Car park, perhaps introduced with grass seed.
Skeet Hill (metropolitan vc16)	TQ4965		1983	DH	Skeet Hill tip site [map reference inferred from this description, location since scrubbed over].
Near Tonbridge	TQ54X		After 1970, before 1981	Philp (1982)	Adventive, TQ54X.
Crockenhill	TQ5066		1986	JP	Hundreds on old allotments, fewer in 1987.
Swanley	TQ5267/5268 ?		21 June 1984	JRP	A dozen plants of var. *hirta* in grass at the top of a motorway embankment at Swanley. [No grid reference given.]
Crayford	TQ5376		June 1993	JRP	Gravelly waste ground, var. *hirta*. {Habitat gone by 2009.]
Between Swanley Bottom and Hextable	TQ57F		(1) 12 June 1997 (2) 4 July 1989 (3) 31 October 1986	(1) -(3) JRP	(1) On country roadside for at least ten years (2) Clement Street, increasing on roadside. (3) Hextable roadside, flowering well. [These records all appear to relate to the same site, where plants ultimately did not persist.]
South Darenth	TQ56U		1977	JRP	Waste ground between allotments, about a dozen plants growing in a dense population of *Vicia sativa* (common form).
Dartford west	TQ5374		2000	JRP	Meadow grassland, small quantity, TQ 533 745 between Dartford and Barnes Cray.
Crayford	TQ5376		1993	JRP	Landfill area, gravelly waste, var. *hirta* [habitat destroyed by 2009].
Swanscombe	TQ67C		1984	JRP	In open bowl of sandy grassland.
Rainham	TQ86E		After 1970, before 1981	Philp (1982)	Clay bank, assumed to be at Horrid Hill (see account above).
Dungeness, Midrips	TR01E, Includes TR0018, TR0118	SSSI	(1) 11 June 2013 (2) 7 August 2012 (3) 18 June 2007	(1) HBG (2) OL, GK, TI & SB (3) RCS	(1) Frequent along c 4m wide road verge from TR 0112 1892 to TR 0117 1896. (2) Two plants with *Carex arenaria* and *C. hirta* at TR 00220 18473 (3) TR 013 189, roadside verge.
Dungeness, South Brooks	TR01I, includes TR0217	SSSI	(1) 6 August 2012 (2) After 1970, before 1981	(1) OL, GK, TI & SB (2) Philp (1982)	(1) a couple of patches in fruit in disturbed short grassland at TR 02564 17610. (2) TR01I.
Dungeness, Lydd Ranges	TR01J, includes TR0218, TR0318, TR0319	SSSI	(1) 16 June 2019 (2) 3 June 2013 (3) 6 August 2012 (4) 6 August 2012 (5) 26 June 1983 (6) After 1970, before 1981	(1) OL (2) OL (3) TI (4) OL, GK, TI, & SB (5) CP, AN (6) Philp (1982)	(1) In grassland, Lydd MOD Ranges, six plants at TR 03354 18871 and three plants at TR 02867 18761. (2) TR0318. (3) TR 039 181. (4) TR 03179 19417, one plant on slope of dyke bank. (5) TR0218. (6) TR01J. [FR in 1953 described the species as locally abundant on the compressed shingle of an old track at the shingle beach between South Brooks and Galloways, an area largely disturbed by tracked

					army vehicles.]
Dungeness, Lydd Ranges	TR01N, includes TR0417	SSSI	(1) 2 June 2013 (2) 26 June 1983 (3) After 1970, before 1981	(1) OL (2) CP, AN (3) Philp (1982)	(1) Two patches on the west side of the Galloways Road (restricted access), Lydd MOD Ranges, at TR 04068 17802 and at TR 04068 17867. (2) TR 040 176. (3) TR01N
Dungeness, south of Lydd	TR01P, includes TR0518	SSSI	(1) 10 June 2021 (2) After 1970, before 1981	(1) CO (2) Philp (1982)	(1) Along west fenceline of Dengemarsh Rd just north of bridleway across RSPB Reserve (pointed out by OL). (2) TR01P.
Dungeness, RSPB reserve	TR01T		After 1970, before 1981	Philp (1982)	
Dungeness, Old Coastguard Cottages, etc.	TR01Y, includes TR0816, TR0817, TR0916	Part within SSSI (coastguard cottages are outside)	(1) 24 June 2014 (2) 20 June 2012 (3) 23 June 2010 (4) 2010 (5) 31 March 2009 (6) 27 June 1996 (7) 2 June 1994	(1) OL (2) GK, LR,OL (3) SB (4) TI (5) DM (6) EGP (7) DW	(1) TR 08455 17305 by the track near to the resident bonfire site over to the crest of the moat near the RNSS Cottages, at TR 08419 17275. A good year, with large amounts of plants flowering in the moat, which the recorder notes historically held a small number of plants in previous years. (2) TR 08457 17288, several plants along shingle above c.3m length of low curving concrete wall north east of Old Coastguard cottages. (3) TR 09388 16946, 13 plants on sparse vegetated shingle near 'new' lighthouse. (4) TR0817. (5) TR0816. (6) TR01Y. (7) TR 085 172, in moat, Bird Observatory..
Dungeness, Lydd-on-Sea	TR01Z, includes TR0819	SSSI	(1) 10 June 2021 (2) After 1970, before 1981	(1) CO (2) Philp (1982)	(1) In grassland along nw edge of Kerton Rd between tarmac pull-in at TR 084 191 and gravel pit entrance. Quite extensive back to fence-line but extent not known. (2) TR01Z.
Lydd, airport and water works	TR0260	SSSI	(1) June 2014 (2) 1997	(1) FJR (2) EGP	(1)1 TR 0604 2077, TR 0605 2076, TR 0605 2082, TR 0605 2083, TR 0606 2077, all in survey of Lydd airport lands. (2) TR 065 293, RSPB reserve.
Littlestone	TR0824	SSSI	(1) 29 May 2021 (2) 20 May 2017	(1) & (2) D	(1) One small patch with flowers on edge of vegetated shingle. Seemed to be the only plant that escaped recent mowing by the council. TR 0843 2427. (2) TR0824, originally found by OL.

Viola canina L. (Heath Dog-violet)

vc 15 & 16

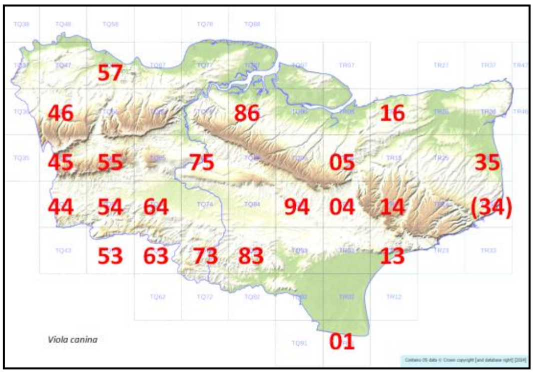
Rarity / scarcity status

Viola canina is widely but patchily distributed in the British Isles, generally in open acid habitats. In Britain it is considered to be **Near Threatened**. In England, however, the decline in its extent of occurrence and area of occupancy (44% and 41% respectively in comparing data over the periods 1930-1969 and 1987-1999) is such that it is regarded as **Vulnerable** to the risk of extinction. In Kent, it verges upon being **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Dartford Heath. Photo by David Steere, 2 May 2016.

Account

The first published Kent records appear in Matthew Cowell's *A Floral Guide for East Kent, etc.* (1839) and under the name of *Viola flavicornis* are credited to Miss E. Harvey, found in Castle field, Walmer, Miss W. Sankey at Tyler's Hill, Canterbury and G.E. Smith at Brabourne Lees[942]. Hanbury & Marshall (1899), treating it as *Viola ericetorum*, considered it a rather rare native of heaths, roadsides, etc., probably often overlooked. They gave fairly few records, including Dartford Heath (where still present, 2021); Tunbridge Wells Common; Penenden Heath; and Hothfield Heath. Its habitats are a little broader than this, with Francis Rose referring to its presence on grass-heaths, leached chalk downs and sand dunes. Francis Rose intended in his unpublished *Flora of Kent* to illustrate a distribution which was widespread in spite of the uncommonness of the species, with records largely drawn from the 1940s, 50s and 60s, given in a map along the lines shown here.



Viola canina* hectad records in reconstructed mapping from Francis Rose's *Flora of Kent

Lamberhurst Quarter. Photo by Stephen Lemon, 10 May 2015

A substantial decline from the position noted by Francis Rose is suggested by the records in Philp (1982), which total eight tetrads (the species being described as a rather rare plant of heathland and scrub on sandy soil) and the six tetrads given in Philp (2010). For the latter survey, 1991-2005, *Viola canina* was specifically searched for, but found only at Dartford Heath, Pembury, Elmstead and Sandwich Bay. However, this decline is not fully substantiated by 2010-24 records, which amount to 15 tetrads (20 monads). These differing recording views are illustrated by the following distribution maps.

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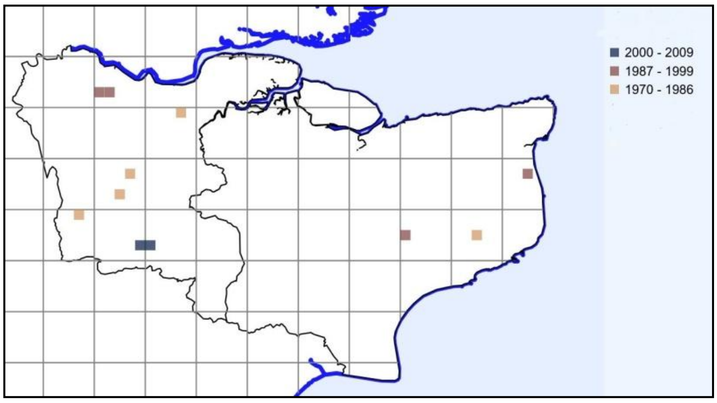
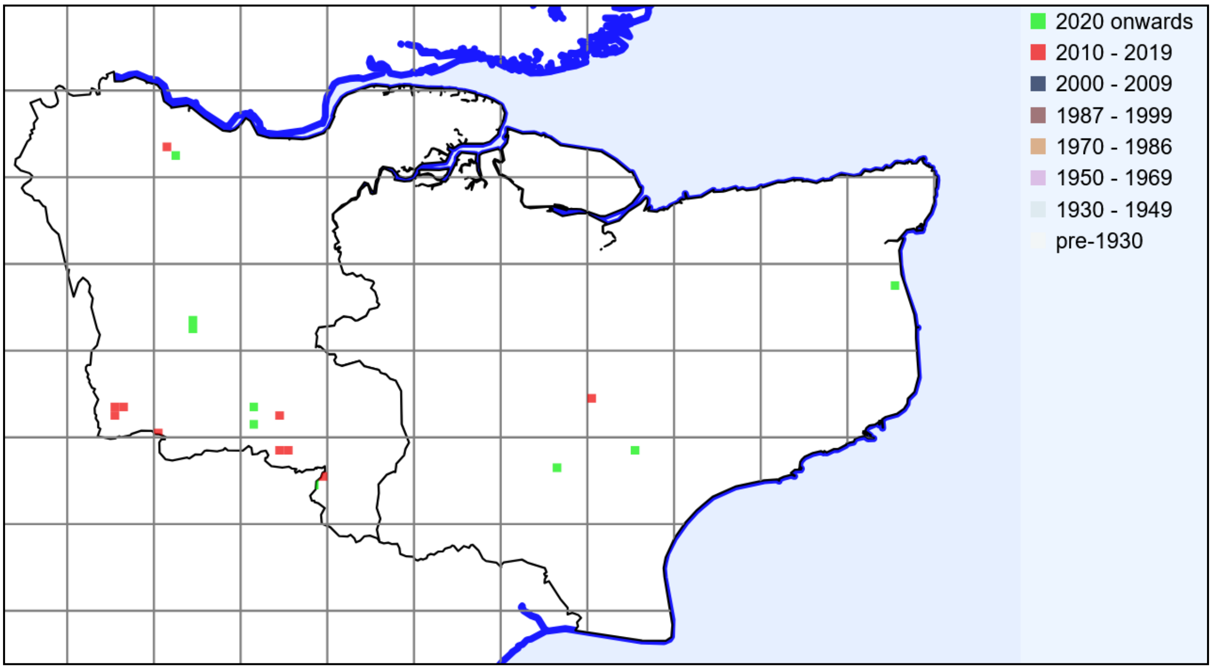
[942] This last find was said by Cowell to have been amongst unpublished records extracted from an interleaved copy of Smith's *A Catalogue of rare or remarkable phaenogamous plants, collected in South Kent*, 1829. The copy with its annotations (mostly 1830-33) still exists and credits the find, which was claimed to be of a white-flowered form near the pond at Brabourne Lees, to J.C. Rickman. I have not been able to trace anything about Rickman, other than that at some stage he appears to have become owner of the interleaved copy, his name being on the fly-leaf.

Viola canina tetrad records 1970-2009, including those in Philp (1982) and (2010)



Viola canina monad records 2010-24, from BSBI database



The maps affirm how the 1991-2005 (Philp, 2010) survey was unsuccessful in locating the plant in five tetrads where known from the 1971-80 (Philp, 2010) survey. By way of comparison, 2010-24 discoveries only cover one of those 'lost' 1971-80 tetrads. In contrast, however, these more recent records include ten monads in the High Wealden part of West Kent, a cluster which represents a concentration to a degree not previously recognised.

Viola canina does not appear to be a particularly mobile species, so it is likely that the trend has been one of a degree of loss since the 1940s-60s, including through agricultural 'improvements', such as the drainage and re-seeding of rough grassland, but with subsequent presence affected by variability of recording.[943] There is a degree of serendipity attached to recognition of this species, given that it is readily overlooked unless in flower; nearly all our 2010-24 records are from the flowering period, mid-April to mid-May. Flowering is followed by seed production and dispersal, the capsules being capable of opening explosively. Dispersal may be more extensive with the aid of ants, to which the seeds, with their nutritious elaiosomes, are very attractive: some 80% of seeds have been noted as carried away by them.[944]

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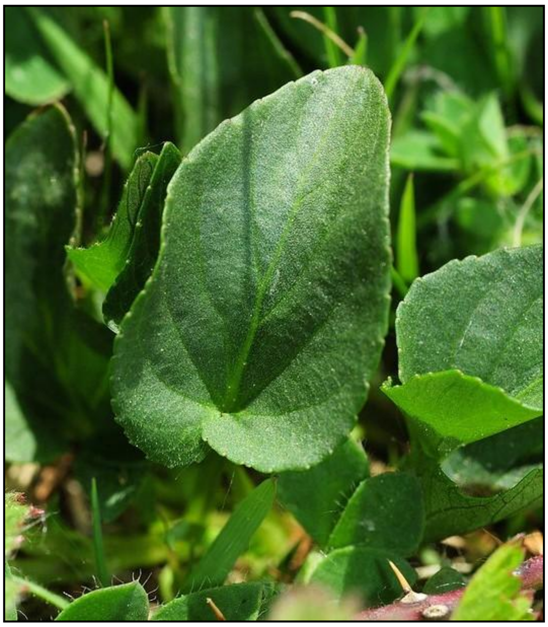
[943] Accordingly, there may yet be potential for further re-finding, e.g. at Hoads (TQ5951, 1964) and Shipbourne Commons (TQ5952, 1948); wood near Pembury Waterworks (TQ6242?);north east Mersham-le-Hatch Park (TR0640 or TR0641, 1960; Gibbon's Brook (TR1138, 1945).

Our recent records include presence in acid *Agrostis capillaris* pasture over Tunbridge Wells Sand Formation at Scotney; in short deer-grazed acid turf over Hythe Formation at Knole Park; in acid grassland over Wadhurst Clay Formation, rabbit-grazed and occasionally mown to keep down brambles, at the Tudeley RSPB reserve; heathy grassland at Dartford Heath on Thanet Formation with a gravelly overlay; in an old meadow at Mersham, probably at the junction of Ragstone (Hythe Formation) and Atherfield Clay Formation; in pastures on Weald Clay near Shadoxhurst; and in a sandy meadow near Sandwich Bay. Despite the name Heath Dog-violet, the plant is not in Kent found primarily on heaths (of which we have little) but is present in grassland in a range of geological situations, mostly (but not invariably) acid and fairly nutrient-poor. The grassland is either thin, in sandy or heathy situations, or else is grazed short. This suggests susceptibility to competition from coarse vegetation where there is under-grazing; and of course if there is scrub or bracken invasion (as may have been the case at Hothfield Heath, where last recorded in 1954). There is also potential for nitrogenous air pollution to increase competition, as *Agrostis capillaris* has been shown to increase growth to the detriment of *Viola canina*[945].


Tudeley Woods. Photo by Lliam Rooney, 12 May 2011

Observations of associated flora have included:

- *Moenchia erecta* (Upright Chickweed) and *Ornithopus perpusillus* (Bird's-foot), plants of sharp-draining, nutrient-poor open ground, at Dartford Heath, where *Calluna vulgaris* (Heather) also accompanied the *Viola*;
- *Pedicularis sylvatica* (Lousewort), a plant of damp acid ground, and *Carex caryop*hyllea (Spring-sedge) at Gilridge south of Edenbridge;
- *Genista tinctoria* (Dyer's Greenweed), a plant favouring grassy fields on clay, and *Carex caryophyllea* at Hobbs Hill west of Fordcombe;
- *Potentilla erecta* (Tormentil), a plant of acid soils although the soil here is near neutral, and *Carex caryophyllea*, at Cowden Pound Pastures;
- *Potentilla erecta, Ophioglossum vulgatum* (Adder's-tongue) and *Succisa pratensis* (Devil's-bit Scabious) at Alex Farm Pastures near Shadoxhurst.

The associated flora indicates an ability of *Viola canina* to accommodate to both dry and damp soils, ranging from acid to neutral, and the frequency of Kent axiophytes and other rare plant register species is indicative of good habitat.

The flora at a number of sites also includes *Viola riviniana* (Common Dog-violet) and hybrids have been suspected, but not always recorded as such. The hybrid (*Viola* x *intersita*) is noticeable as forming large floriferous clumps failing to set seed, so that after flowering, the dead brown flowers remain. The hybrid plants are variably intermediate, but generally show leaf bases more cordate than *Viola canina*, flower spurs which are paler yellow and stipules which are only shortly fimbriate. The cross was first observed in Kent in 1882, by G. Nicholson (specimens in **SLBI**) and has been recorded sporadically since, most recently at Borough Green, Chiddingstone Causeway, Dartford Heath and Scotney estate.

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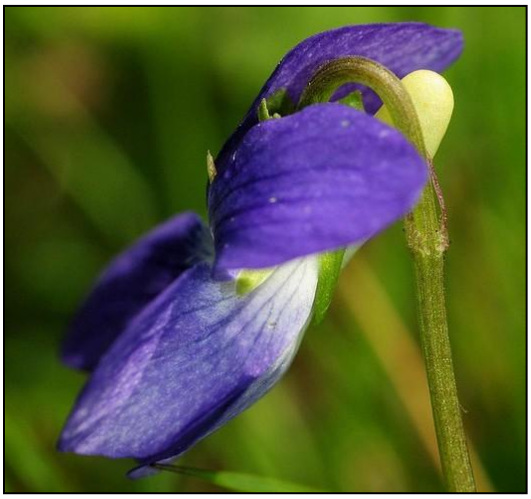
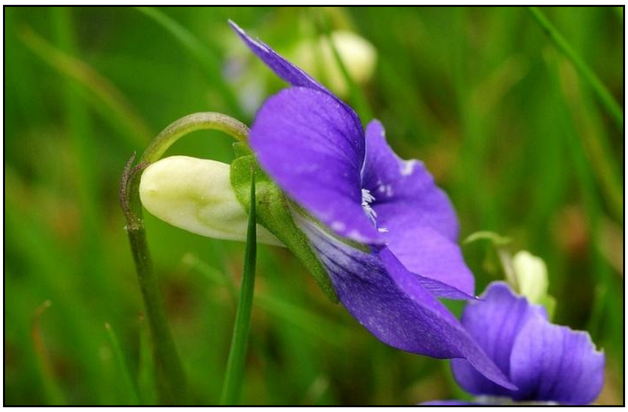
[944] Dostál, P. (2005). Effect of three mound-building ant species on the formation of soil seed bank in mountain grassland. *Flora* **200**: 148–158. This study was carried out in Slovakia, but ant species occurring in Britain were involved.

[945] Dueck, Th. A. & Elderson, J. (1992). Influence of NH_3 and SO_2 on the growth and competitive ability of *Arnica montana* L. and *Viola canina* L. *New Phytologist* **122:** 507-514.





(Right) *V.* x *intersita*, Scotney. Photo by Lliam Rooney, 15 May 2016

(Left) *V. canina*, Tudeley Woods. Photo by Lliam Rooney, 12 May 2011. Note the paler spur of the hybrid, on the right.

Viola canina has also been recorded in Kent as hybridising with *Viola lactea* (Pale Dog-violet) (*Viola* x *militaris*), mostly on Tunbridge Wells Common, but the last record was around 1936, as also for *V. lactea* itself.

There are two British subspecies of *V. canina*, subsp. *montana* and subsp. *canina*; in Kent we have only the latter. Subsp. *canina* has varieties recognised in Britain: var. *calcarea*, a small plant of dry limestone, and var. *pusilla*, a plant of sandy shores and heaths with large blue flowers. In neither case have we any record of presence in Kent.

V. x *intersita*, Scotney. Photo by Lliam Rooney, 15 May 2016

The species may be distinguished from other Kent violets by its leafy flowering stems arising from the base of the plant without any rosette of leaves there, and by the leaves being long-triangular. The nearest other violet in terms of appearance is *Viola riviniana* (both were united by Linnaeus under the name *Viola canina*), especially as the pale flower spur of *V. riviniana* may occasionally be tinged yellow, although not as strongly yellow as that of *V. canina.* They differ, however, in a number of respects, e.g. leaves ovate-orbicular (*V. riviniana*) v. triangular (*V. canina*); leaf upper surface with sparse hairs v. glabrous or nearly so; stipules with numerous patent teeth v. stipules with few, forwardly-directed teeth; flowers tending to violet v. flowers tending to blue.

Viola palustris L. (Marsh Violet)

vc 15 & 16

Rarity / scarcity status

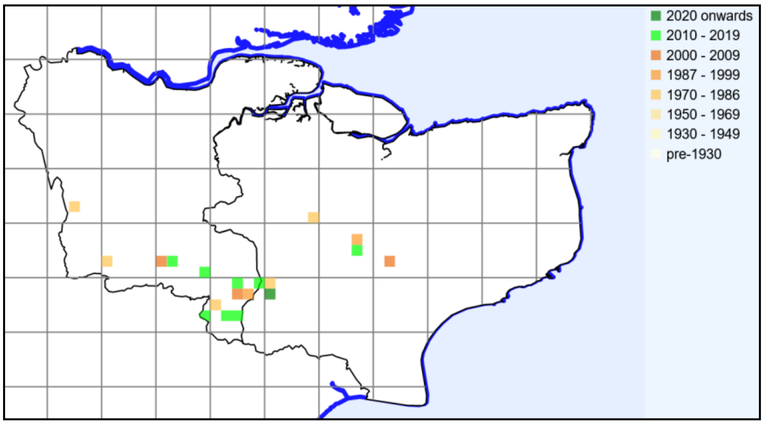
Viola palustris is widely distributed across the British Isles, primarily in the west. In south east England it is scarcely to be found outside north east Norfolk and the Weald. Its conservation risk status in both England and Great Britain as a whole is one of ‘Least Concern’. In Kent it is **scarce**. It is a Kent axiophyte and so is indicative of good habitat.

Hothfield. All photos by Lliam Rooney, 19 April 2011

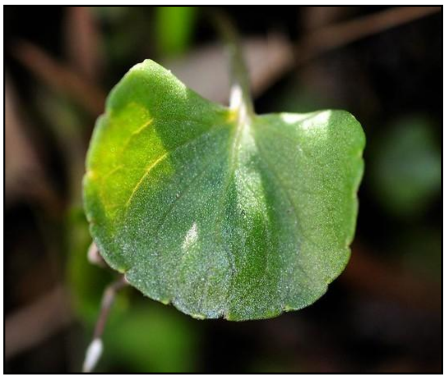
Account

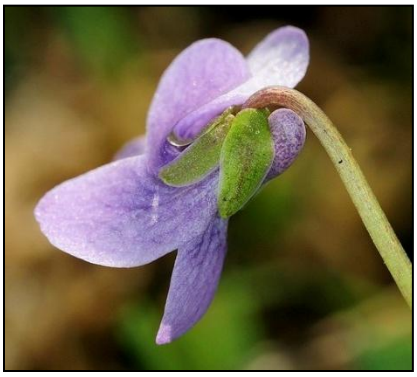
The first Kentish record of Marsh Violet may well be that of James Petiver in his *Graminum, muscorum, fungorum, submarinorum etc., Britannicorum Concordia* (1716), in which he refers to it in a bog between Wickham and Croydon, which could have been in either Kent or Surrey. Failing this, the next earliest appears to be a note by G.E. Smith (probably 1830-33) of it growing ‘On turfy bogs, inland, as at Smeeth, Sellinge, etc. among alders’. Hanbury & Marshall (1899) considered it to be a local plant of spongy bogs and wet places in woods. Most of their records were for the High Weald, but they included Matthew Cowell’s records (*A Floral Guide for East Kent, etc*., 1839) from Dr Hunter in marshes at Minster, Monkton, St. Nicholas and Sarre, which might be regarded as doubtful, these marshes not being acid enough for the species’ usual requirements. However, Alex Lockton (personal communication) has suggested that, although not now present, there may have been areas where the sedge peat built up to such an extent that it turned ombrotrophic. Whatever the position there, on the other hand, there would seem no doubt about Edward Jenner’s comment ‘On all the bogs in the neighbourhood’ in his *A Flora of Tunbridge Wells, being a list of indigenous plants within a radius of fifteen miles around that place* (1845).

Francis Rose, writing *c.*1960, regarded it as confined to the High Weald, where he knew of it as locally frequent in 18 localities, and on the sands of the Folkestone Formation, where it occurred in six, crossing the county from Greatness, Sevenoaks to Brabourne Lees. He described it as a native of valley bogs, and flush bogs in alder woods with acid drainage water, usually among sphagnum. Philp (1982) recorded it 1971-80 in twelve tetrads, a rather local and scarce plant of bogs and wet marshy places in heaths and woodlands. This may have understated the position in the High Weald, where Joyce Pitt’s subsequent records approximately doubled that coverage (these are mostly not represented in our data below). However, the 1991-2005 survey of Philp (2010) found the plant apparently decreasing, with only nine tetrad records achieved. Similarly, our 2010-24 records amount to nine tetrads (11 monads) which suggest a levelling off, although it is quite possible that we are still under-recording in the High Weald.



Viola palustris **Kent records to 2024 mapped at tetrad level, from BSBI database.**





The violet grows in situations which are fairly open, such as Hothfield Bog, and in light shading afforded by woodland. Our recent records generally refer to presence in proximity to a stream, or growing on boggy or flushed ground which may be alongside a path or track; sphagnum was observed in some cases and this probably suits rhizomatous growth. As well as spreading by rhizomes, plants may spread by seed, released explosively from capsules, and cleistogamous flowers are formed in summer.

Viola palustris is characterised by long creeping rhizomes with leaf-stalks and flowers arising from the nodes, there being no above-ground stems. Leaves are near-orbicular; their cordate base may be obscured at a stage of growth when the leaf folds round. The flowers are pale lilac, with dark branching veins on the lower petal.

Records from Philp (1982) and Philp (2010) are not included in this table as they consist of no more than a tetrad grid reference and may be found on the distribution map above where not overlain by a more recent find.					
Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Pembury Walks east	TQ6242		5 April 2014	KFC meeting	Valley mire, trackway below power lines.
Bewl - Chingley wood west	TQ6833		26 August 2017	SL	Chingley Wood, semi-shaded sphagnum flush on flat ground near ghyll stream, TQ 6883 3386.
Bewl - Chingley Wood east	TQ6933		22 August 2019	SL, CAS. & DSt	Chingley Wood, mixed woodland at headland of ghyll, TQ 692 334.
Horsmonden west	TQ6940		13 June 2015	SL.	TQ 6928 4093, abundant and flowering in rough acid grassland above southern edge of Furnace Pond.
Bedgebury Forest - pinetum	TQ7233	Access land	10 August 2011	KBRG meeting	Alongside stream TQ 7212 3343.
Bedgebury Forest - Louisa Lake	TQ7332	Access land	(1) 13 July 2019 (1) 2 April 2011	(1) SL (1) KFC meeting	(1) Bedgebury Forest, damp runnel running into north-western corner of Louisa Lake, TQ 7322 3291. (1) eastern edge Lousia Lake, where Forestry Commission were requested to clear two years ago as it was very scrubbed with sallow and rhododendron; some work had been done some work but more is needed..
Iden Green north	TQ7438		4 May 2013	KF	TQ 749 389, leaves only.
Hartley south - Badger's Oak (vc16)	TQ7533	Access land	13 April 2017	JP	TQ 751 337 in wet peaty path with sphagnum.
Cranbrook common north - Foxearth Wood (vc15)	TQ7939		5 July 2010	JP	Foxearth Wood.
Hemsted Forest	TQ8136	Access land	(1) 26 April 2022 (2) 15 August 2021 (3) 21 July 2021 (4) 14 July 2016	(1) DC (1) SL (1) SB (1) JP	(1) TQ 818 365. Large patch of flowering plants running for about 30 yards down a boggy north sloping track. (1) Hemsted Forest, Chittenden Wood, TQ 8190 3678. Boggy scrub

					developing in open north south ride between pine plantations. (1) In a boggy stream at TQ 8176 3631 (1) TQ8136.
Hothfield west	TQ9645	SSSI, KWT reserve, access land	29 May 2012	SB	Bog on Hothfield Common at TQ 96803 45909.

Viola tricolor L. subsp. *tricolor* (Wild Pansy)

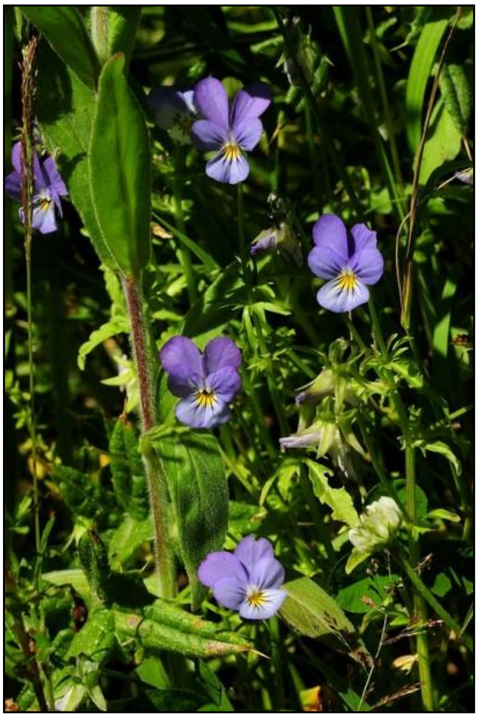
vc 15 & 16

Rarity / scarcity status

Viola tricolor is widely distributed across the British Isles, represented as a perennial by subsp. *curtisii* of sand dunes and by subsp. *saxatilis* of upland pastures, and as an annual by subsp. *tricolor* which is a plant of cultivated ground and is what we encounter in Kent. Subsp. *tricolor* appears to be in decline, especially in south east England, and is considered to be **Near Threatened** in both England and Great Britain as a whole. This designation is supported by a comparison of English data over the periods 1930-1969 and 1987-1999 showing that its area of occupancy had declined so that there was a calculated 28% reduction in the likelihood of recording the species. There is evidence of a 66% decline in Kent between 1971-80 and 1991-2005, and it is currently verging on **scarce** in the county. It is a Kent axiophyte and so is indicative of good habitat.

Account

The first published Kent record was at Blackheath, given by Thomas Martyn in his *Plantae Cantabrigienses* (1763). This was followed by Edward Jacob (*Plantae Favershamienses*, 1777) who knew it as '*In Corn fields at* Ore, *and in Gardens – common'*, and gave its vernacular name as well, Three Faces under a Hood[946]. Presence in both fields and in gardens was probably typical of the time, and *Viola tricolor* was then the normal garden pansy. Development of the present garden pansy, *Viola* x *wittockiana*, began in England in the 1810s-30s and *Viola tricolor* came to be superseded for horticultural purposes. A present-day purported record of *Viola tricolor* in or near a garden is likely to be of *Viola* x *wittockiana* which, left to set seed on its own account, may result in hybrid segregation with some progeny resembling *Viola tricolor* as one of the original parents.



Rhodes Minnis. Photo by Lliam Rooney, 3 July 2014

Hanbury & Marshall (1899) described the species as a common native of fields and banks, etc. in Kent and devoted much attention to its various forms which had been given Continental species names. It may be questioned how far this taxonomy has value, and the only current British Flora which goes deeply into this is the *Flora of Great Britain and Ireland* (P. Sell & G. Murrell, 2018, vol.1) which gives four subspecies, one of which has eight varieties, another has two and another has five. How these relate to Kent is given below in an appendix to this register account. Francis Rose considered this variable species (probably with reference to the position in the 1950s and 60s) as a frequent colonist of cornfields and waste ground, chiefly on acid soils, but by the time of the 1971-80 survey published in Philp (1982), it was regarded as rather local and scarce, with 35 tetrad records in that period. Decline continued apace, and in the period 1991-2005 only 12 tetrad records were made for Philp (2010). This position is endorsed by our 2010-24 records, which amount to 11 tetrads (12 monads). The following distribution map shows the sharp decline from the 1970s; any preceding decline from the 1950s/60s is not so evident, as records for all species to tetrad level were not made so frequently before 1971.

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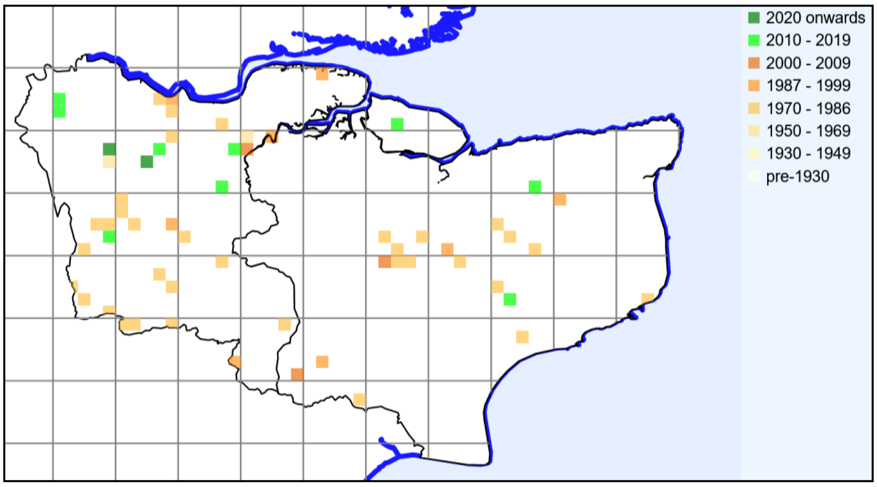
[946] Kitty-run-the-street is another Kentish name for the plant – Parish, W.D. & Shaw, W.F. (1888). *A Dictionary of the Kentish Dialect and Provincialisms.* Farncombe & Co., Lewes.

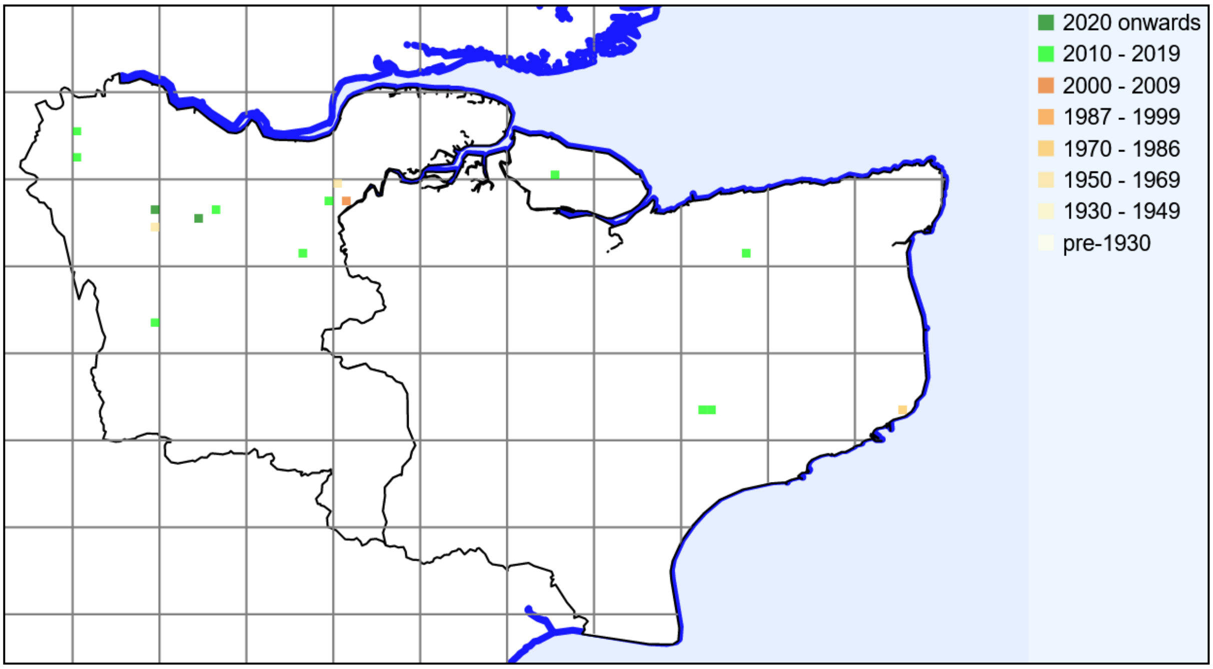


***Viola tricolor* Kent records to 2024 mapped at tetrad level, from BSBI database.**

The decline is likely to have similar causes to that of other arable weed species over the same period, and to be rooted in agricultural practices, especially the use of herbicides. It is a predominantly out-crossing, bee-pollinated annual plant, although capable of living longer, and in an arable context is very much reliant upon being enabled to flower and seed at untreated margins; it is assisted in this by a long flowering period (April to September).

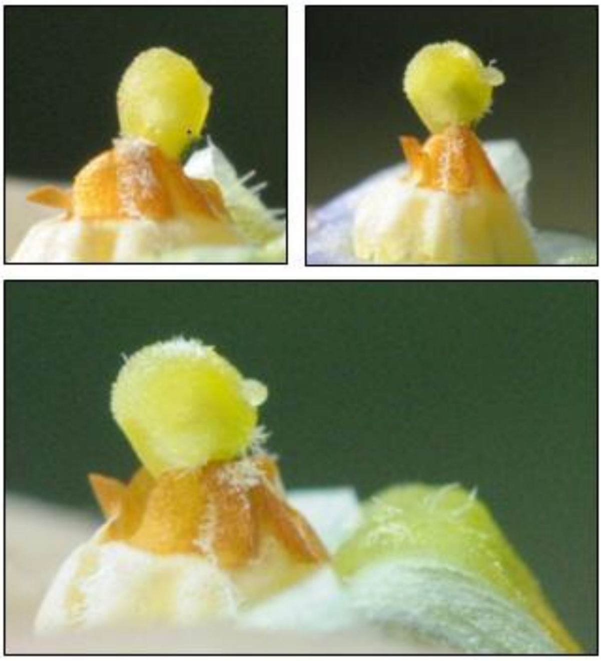
Our current register data for this species, shown at monad (1km square) level, are displayed in the next following distribution map. It is fairly similar to the recent elements of the preceding map, showing that each tetrad record (except in one case) contains only one monad record out of the four in each tetrad. This is indicative of a species with scattered and isolated occurrences. The exceptional case, at Stowting, was of presence, at most 240m apart, in separate field strips in adjoining monads. In spite of our attempts to exclude records which may be segregated forms of garden pansy, this may be the origin of the metropolitan north west Kent occurrences and was considered a possibility for that in Sheppey, even though at a wheat-field margin.

***Viola tricolor* Kent records to 2024 mapped at monad level, from BSBI database.**

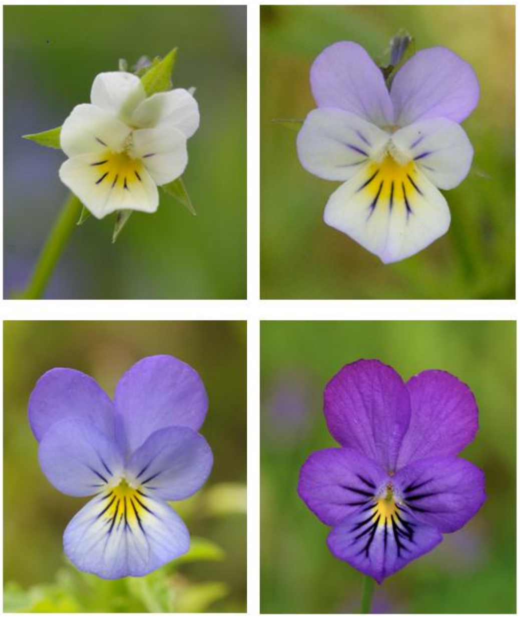


The best recent occurrences have been near Sundridge, west of Manor Farm (2012), where present along 200m of arable field margin (although herbicidal treatment and grassing over seem to have inhibited any future sightings) on Hythe and Sandgate Formations; near Eynsford (2021) at a field border from TQ 546 559 to TQ 547 660, which was the best display that the recorder (Rodney Burton) has seen in the county, growing on downwash over chalk; south west of Crockenhill (2019-20), where around TQ 4985 6627 at least 30 plants were present in the corner of a sandy/pebbly field on the Harwich Formation, formerly arable but grassing over; and at Stowting Rough (2014), on sandy loam over clay-with-flints, where there were 63 plants in an area about 30 x 10m and a further nine plants in an adjacent monad), in strips of disturbed ground that had probably been ploughed within the previous year. Geology does not seem to be a restricting feature.

Viola tricolor hybridises with *Viola arvensis* (Field Pansy) to produce *Viola* x *contempta*. Some of our *V. tricolor* records indicate a degree of variation and the presence *of V. arvensis.* There may be some hesitation in recording the hybrid when the morphological boundaries of the species may be unclear but equally we have recorde*d V. x contempta* in situations where *V. tricolor* was not observed. Overall, we have two thirds the number of monad records for the hybrid in the period 2010-23 than for *V. tricolor* (i.e. 8 versus 12) and have recorded it at Ashford, Crockenhill, Hothfield, Luddesdown, Ranscombe, Rhodes Minnis, Wrotham and Wrotham Water. Porter & Foley (2017)[947] note the hybrid as having flat or slightly cup-shaped corollas, which are variably intermediate in size between the parents (whose vertical measurements are 8-12mm and 18-22mm), with upper petals and upper sepals similar in length. Upper petals are often tinged mauve or blue, and the pedicel arch is only indistinctly grey-blue. Not mentioned by Porter & Foley is the stylar flap, which the accompanying photos show to be intermediate between the parents in its projection.



Styles, showing the stylar flap as a projection to the right.
Top left, *Viola arvensis*; top right, *Viola tricolor*; below, *Viola x contempta*.
Photos from Stowing Rough, by Alfred Gay.



Stowting Rough *Viola* population samples.
Top left, *Viola arvensis*; top right, *Viola* x *contempta*;
bottom left and right, *Viola tricolor*.
Photos © Alfred Gay

The hybrid is highly fertile and may backcross, giving rise to a wide range of variation. Repeated backcrossing is probably the cause of some populations approaching the form of one or other parent, and then is perhaps better described as introgression. The extent of variation of both parents, but especially *V. tricolor*, complicates the position as regards identification of the hybrids, and is best considered in the context of a population. For what it is worth, details of named *V. tricolor* variation are given below, although in addition, *Viola* x *contempta* has itself been treated as a variant of *V. tricolor*, having regard to its fertility.

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[947] Porter, M. & Foley, M. (2017). *Violas of Britain and Ireland, BSBI Handbook No. 17*. Botanical Society of Britain and Ireland, Bristol.

Appendix: ***Viola tricolor* segregates in Kent**

As regards how these relate to Kent, some detail is given by Drabble (1909)[948], viz.

- *Viola cantiana* Drabble (now *V. tricolor* subsp. *tricolor* var.*cantiana* (Drabble) P.D. Sell). Named by Drabble after Kent (Cantium = Kent), as the only place in which he had seen it (recorded from Sevenoaks). 'The very sharp and definite colouring of the petals is characteristic of this pansy; this and the caespitose habit, the relatively long internodes, and the very small hairy or hispidulous leaves and small stipules render this plant easy to recognise. It is one of the best marked of our pansies. It seems to be very rare.'
- *Viola lloydii* Jord. (now *V. tricolor* subsp. *tricolor* var. *lloydii* (Jord.) Rouy & Foucaud). Sandling and Sevenoaks.
- *Viola variata* Jord. (now *V. tricolor* subsp. *tricolor* var. *variata* (Jord.) Rouy & Foucaud). Ide Hill.
- *Viola lepida* Jord. . (now *V. tricolor* subsp. *saxatilis* var. *lepida* (Jord.) Rouy & Foucaud). Sandling Park, Benenden, Wrotham, Sevenoaks, Knockholt.

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[948] Drabble, E. (1909). The British Pansies. *Journal of Botany* **47** (supplement 2): 1-32.

Vulpia ciliata Dumort. subsp. *ambigua* (Le Gall) Stace & Auquier (Bearded Fescue)

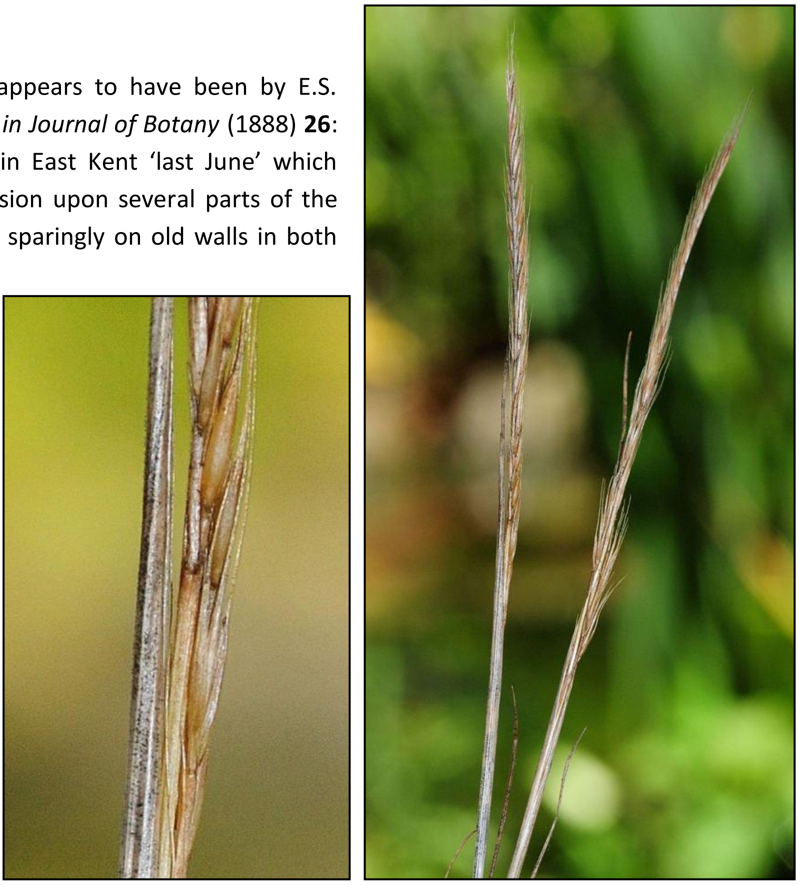
vc 15 & 16

Rarity / scarcity status

Vulpia ciliata subsp. *ambigua* is primarily a coastal grass of sand and shingle in south Britain, secondarily a plant of inland sandy areas and roadsides, whose threat status in both England and Great Britain as a whole is one of 'Least Concern'. While it is **nationally scarce**, in Kent it is neither rare nor scarce, but recent records have fallen off somewhat, although it is unclear whether there is a real decline, or whether it is under-recorded.

Account

The first Kent record for this grass appears to have been by E.S. Marshall, who sent in a list, published *in Journal of Botany* (1888) **26**: 312, of plants found during a week in East Kent 'last June' which included '*Festuca ambigua*... In profusion upon several parts of the sandhills from Sandwich to Deal; also sparingly on old walls in both towns; doubtless overlooked from its withering early'. Hanbury & Marshall (1899) regarded it as a rare native of dry ground on the coast, perhaps overlooked from confusion with *Vulpia myuros* (Rat's-tail Fescue) as well as its early flowering period (mostly May-June). They added sites at Stonar Beach, Sandwich and near Littlestone, towards Dymchurch. This probably included Romney Warren, from which it was collected in the 1930s (specimen at **BIRM**) and known to Francis Rose from 1946, as also at Lydd Common and Dungeness.



From Sandwich Bay. Photo by Lliam Rooney, 2012

Inland records began to be recognised from the 1940s onwards, with the publication[949] by Francis Rose of records located at a Brabourne Lees sandpit; by the A20 near Ashford Warren; on a sandy bank of the A20 at Leeds (where abundant) and Willesborough; also the first West Kent records since 1903[950], at Wrotham Heath (where known to him, 1944-62) and Ryarsh sandpits (1945). It is noticeable that these records follow the sands of the Folkestone Formation across the county, as does the A20. Philp (1982) recognised it as present in 23 tetrads in 1971-80, favouring dry sandy areas on roadside verges and railway banks, and on coastal sand-dunes; it was very local but often quite frequent where occurring. In the 1991-2005 survey published in Philp (2010) the number of tetrads had risen to 26, but with broadly the same distribution: concentrations around Deal/Sandwich and Dungeness

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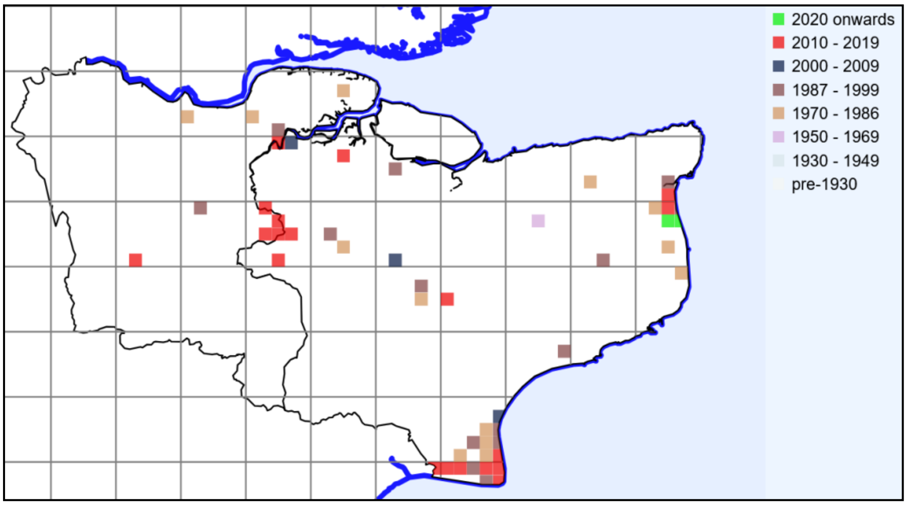
[949] *Botanical Exchange Club report* for 1945 (1947) **13**: 74. Habitat details, however, are not given here but are in Rose's manuscript *Flora of Kent*.

[950] This was a report by W.H. Griffin in the *Woolwich Survey*s (1909) of a roadside find at Skid Hill, which forms the (vice-) county boundary west of Biggin Hill.

Sandwich Bay, foreground plant. Photo by Sue Buckingham, 26 June 2021

Our more recent records, however, show a slight falling off, with 21 tetrad records (24 monads) made in the period 2010-23. This apparent trend is shown in the accompanying tetrad distribution map. A substantial proportion of the 2010-24 records relates to the Maidstone area and the grass has been only patchily recorded in its former stronghold, Dungeness. The TQ75 Maidstone records were all by a single recorder and were generally on roadsides in urban and suburban situations. Habitat change at Dungeness areas has not been sufficient to explain a decline after 1970-2009. Climate change does not seem a likely cause of any decline, either: the species is likely to be favoured by climate change, with growth benefited by warmer winters and springs, and the necessary open habitat encouraged by summer drought[951]. The most likely explanation for the reduction in records accordingly seems to be an absence of recorder recognition.

***Vulpia ciliata* Kent records to 2023 mapped at tetrad level, from BSBI database.**



It is capable of being confused with *Vulpia myuros*, which frequents similar habitats. It has, however, more rigid panicles, purplish when mature, and the leaf sheaths from which the panicle may not fully emerge is somewhat inflated. With *V. myuros*, it has very unequal glumes, the longer being six times the length of the shorter in *V. myuros*, three to four times for *V. ciliata*.

It is a winter annual,[952] with germination starting from September, peaking in autumn; and young plants continue to grow, adding leaves through winter. Growth accelerates in spring, and inflorescences start forming in April. The plants are self-pollinating and seed production per plant in an East Anglian survey ranged from 2 to 80, although production per plant within a population may vary in different years. Seed dispersal takes place in late June and in July. Lacking a seed-bank and having a restricted seed dispersal range (mean distance 6cm), its dependence on annual re-establishment may give rise to considerable fluctuations in population size from year to year, or even extinction. Nevertheless, colonies may be long-lived and an assessment of 46 (presumed non-Kentish) sites over periods of up to 50 years gave rise to a calculation of a half-life of populations of just over 30 years, Soil preferences are for a well-drained and infertile substrate, generally sand or shingle; highway dust may also be acting as a proxy for this.

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[951] Firbank, L.G., Watkinson, A.R., Norton, R. & Ashenden, T.W. (1995).Plant populations and global environmental change: the effects of different temperature, carbon dioxide and nutrient regimes on density dependence in populations *of Vulpia ciliata*. *Functional Ecology* **9**: 432-441.

[952] Biological and ecological data in this paragraph are largely derived from:

(1) Watkinson, A.R., Newsham, K.K. & Forrester, L. (1998). *Vulpia ciliata* Dumort. ssp. *ambigua* (Le Gall) Stace & Auquier (*Vulpia ambigua* (Le Gall) More, *Festuca ambigua* Le Gall). *Journal of Ecology* **86**: 690-705.

(2) Carey, P.D. (1994). *Vulpia ciliata* Dumort. subsp. *ambigua* (Le Gall) Stace & Auq. Bearded Fescue. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. (1994) *Scarce Plants in Britain*. JNCC, Peterborough.

The register data for this species are set out in the table below, and have been selected so as provide records with site details at least to monad (1km square) level of resolution. Older records to tetrad level are sufficiently represented by the distribution map above. The table not only contains fewer records than one might have expected, but there is less supporting information than one might have hoped as regards habitat, population size, associated flora, etc.

There is another subspecies, subsp. *ciliata* from central and southern Europe, which is larger in its parts and rarely introduced into the British Isles. The only Kent record traced is at a brickworks south of Hoo, in 1951. Our records have generally been made as subsp. *ambigua*, but in some cases they are of the plain species, *V. ciliata*, and in the absence of anything pointing to the contrary, we have assumed that they represent subsp. *ambigua*.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Sevenoaks Weald	TQ5351		3 July 2019	GK	TQ 5360 5178, small population at edge of A21 carriageway by lay-by on northern side. Recorded as *V. ciliata.*
Aylesford south	TQ7258		15 July 2016	BW	roadside verge, urban or suburban.
East Farleigh, north	TQ7354		15 June 2017	BW	Barming.
Coxheath south east	TQ7450		24 September 2016	BW	roadside verge, urban or suburban.
Coxheath	TQ7451		15 August 2018	BW	roadside
Allington	TQ7457		14 September 2016	BW	roadside verge, urban or suburban.
Rochester, vc15	TQ7468		22 June 2018	GK	one plant on parapet of Rochester roadbridge, vc15 side.
Maidstone,vc15	TQ7555		29 June 2015	BW	
Maidstone central, vc15	TQ7655		29 June 2016	BW	roadside verge, urban or suburban.
Lower Halstow	TQ8567		4 June 2015	SP & DC	Recorded as *V. ciliata.*
Jury's Gap & Kentpen Wall	TQ9918	SSSI	07 August 2012	GK, OL, TI	
Lydd Range - Midrips	TR0018	SSSI	09 August 2013	GK, OL, TI	Recorded as *V. ciliata.*
Lydd Ranges - north west	TR0219	SSSI	06 August 2012	GK, OL, TI, SB	
Lydd Ranges - West Ripe	TR0319		07 August 2012	GK, OL, TI, SB	sandy / shingly ground, TR 036 194
Dungenes – Walkers Outland	TR0618	SSSI	15 June 2010	GK	Recorded as *V. ciliata.*
Dungeness - Old Coastguard Cottages etc.	TR0817		09 August 2012	TI	Recorded as *V. ciliata.*
Dungeness – Long Pits	TR0818		30 July 2011	TI	Recorded as *V. ciliata.*
Greatstone south	TR0821		29 June 2013	TI	
Ashford	TR0045		7 June 2018	SB	Dry sandy grassland area, Eureka Park TR 0079 4502. Recorded as *V. ciliata.*
Sandwich Bay	TR3557	SSSI	26 June 2021	SB	Dune grassland by public footpath TR 3573 5779. Recorded as *V. ciliata.*
Sandwich Bay	TR3558	SSSI	13 June 2018	SB	Bare sand St George's golf course by public footpath TR 3570 5835. Recorded as *V. ciliata.*
Sandwich Bay	TR3559	SSSI	6 June 2019	SB	Disturbed sand alongside old practice range Prince's golf course,

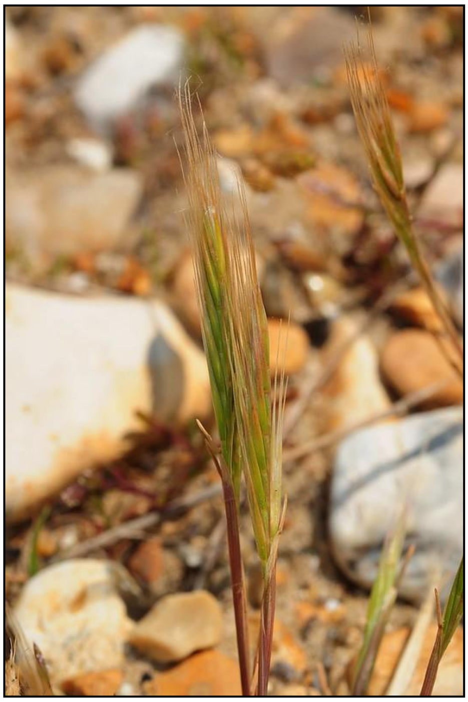
					TR 3514 5924. Recorded as *V. ciliata.*
Sandwich Bay	TR3560	SSSI	12 June 2012	SB	10 clumps in dune grassland at TR 35328 60064, with *Trifolium glomeratum* etc. Recorded as *V. ciliata.*
Sandwich Bay estate	TR3657		28 June 2024	SB	Abundant at TR 3626 5735 on sandy grass verge of North Road on the Sandwich Bay private estate.

Vulpia fasciculata (Forssk.) Fritsch (Dune Fescue)

vc 15

Rarity / scarcity status

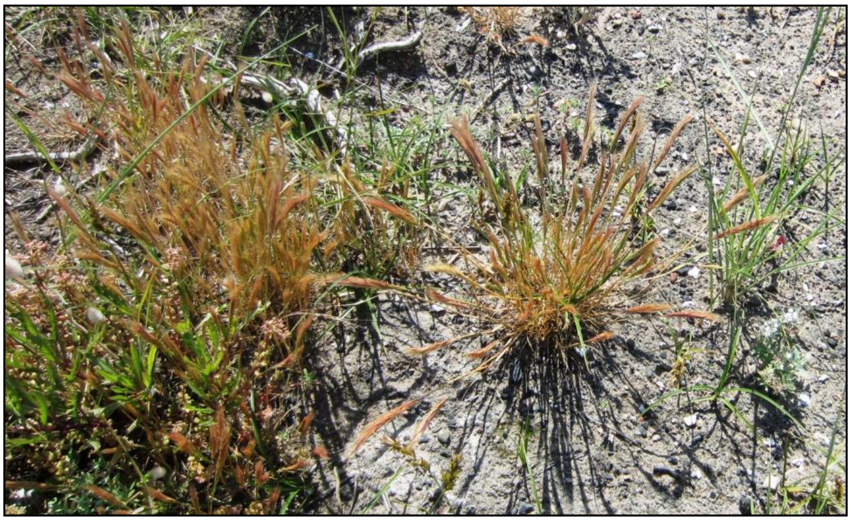
Vulpia fasciculata is a coastal grass of sand dunes, widely distributed in the British Isles, but nonetheless n**ationally scarce**. Its conservation risk status in England and Great Britain as a whole is one of 'Least Concern'. In Kent it is **scarce**, but its populations are probably broadly stable.



Littlestone. Photo by Lliam Rooney, 5 June 2010 (first field meeting of Kent Botanical Recording Group)

Account

The first published reference to *Vulpia fasciculata* as a Kentish species is (as *Festuca uniglumis*) by J.T. B. Syme as editor of the third edition of *English Bo*tany (vol. xi, 1872) where Kent is mentioned as part of its range of distribution. Hanbury & Marshall (1899) refer to it as a native of sandhills on the coast, very rare. The only location they could give was north of Deal, where Marshall saw it growing, sparingly. However, the next year, Lady Davy found it growing at Littlestone, so that there were records in both of what remain as its areas of presence in Kent. Lady Davy's record, however, does not appear to have been common knowledge and it was not until the publication of Philp (2010) that it was generally appreciated that Eric Philp had found it at Greaststone, Littlestone and St. Mary's Bay (at some time in the period 1991-99 for the first of these sites, 2002 for the other two). With the Deal/Sandwich colony, this produced a total of seven tetrad records for 1991-2005. The same total (but from eight monad records) has been achieved in our 2010-24 recording.



Greatstone dunes. Photo by Geoffrey Kitchener, 20 June 2012

It is a winter annual[953], germinating from September to December when soil moisture levels are sufficient. Germination may occur of seeds lying on the surface, but slight burial is needed for establishment. Thereafter, plants continue to grow until late December, after when winter growth generally amounts to the replacement of senescing parts rather than net growth, which is only resumed in spring. Inflorescences start forming in late March and April, and begin to emerge in May for flowering in late May and June. The plants are generally, but not wholly, self-fertilising and seed dispersal takes place in late June and in July. Lacking a permanent seed-bank and having a restricted seed dispersal range (most seed lands within a few centimetres of the parent and does disperse much further on the ground unless it is open sand), it is dependent on annual re-establishment.

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[953] Biological and ecological data in this paragraph are largely derived from:
(1) Watkinson, A.R. (1978). *Vulpia fasciculata* (Forskål) Samp. (Biological Flora of the British Isles). *Journal of Ecology* **66**: 1033-1949.
(2) Carey, P.D. (1994). *Vulpia fasciculata* (Forskål) Fritsch. Dune Fescue. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. (1994) *Scarce Plants in Britain.* JNCC, Peterborough.

Soil preferences are for a well-drained and infertile substrate, generally sand or shingle; it does not grow well in damp dune slacks or on compacted shingle. It usually occurs where vegetation cover is less than 80% and our recent records refer to bare sand patches, bare dune sand and upper beach shingle. Perhaps in consequence of this barenesss we have little data on associated flora in Kent, although it has been observed with *Silene conica* (Sand Catchfly), another winter annual of sandy ground, at Littlestone.

Greatstone dunes. Photo by Lliam Rooney, 20 June 2012

The intergeneric hybrid with *Festuca rubra* (Red Fescue) (= X *Festulpia hubbardii*) has been recorded at Sandwich Bay area in 1954 and may well re-occur there. The hybrid is a more or less rhizomatous and highly sterile perennial, looking like *F. rubra* but with particularly long-awned lemmas and a more distinctly one-sided inflorescence.[954]

As regards *Vulpia fasciculata* itself, this has long lemmas in comparison with similar grasses, especially other *Vulpi*a species, being 8-16mm with awns two or three times as long. Glumes are often used for separation of *Vulpi*a species, and the upper glume of *Vulpia fasciculata* is also comparatively long at 10-14mm, 15-20 times the size of the vestigial lower glume. The inflorescence is fairly dense and erect, and the leaf sheaths are much inflated.

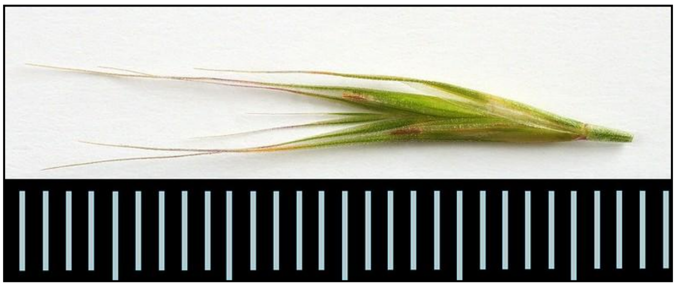
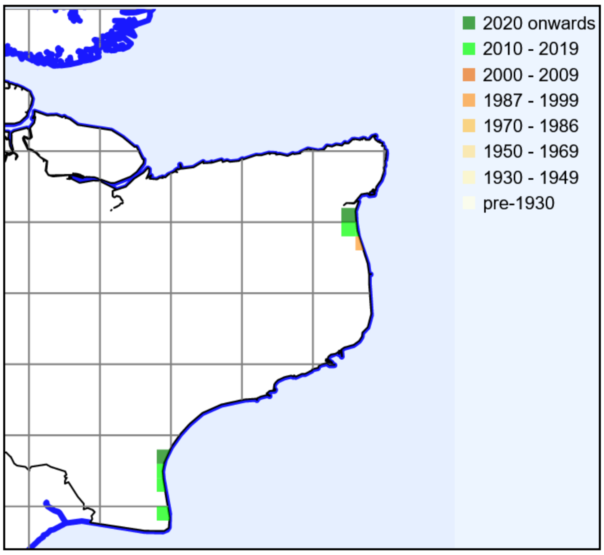


Photo by Lliam Rooney, 105 June 2015



Kent *Vulpia fasciculata* tetrad records to 2024, from BSBI database.

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[954] Stace, C.A. & Cotton, R. (1974). Hybrids between *Festuca rubra* L. sensu lato and *Vulpia membranacea* (L.) Dum. *Watsonia* **10**: 119-138.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Dungeness - Long Pits	TR0818		22 June 2013	OL	
Littlestone south	TR02W, includes TR0823		(1) 11 June 2011 (2) 1991-99	(1) KBRG meeting (2) EGP	(1) Greatstone dunes, TR0823. (2) TR02W.
Littlestone north	TR02X, includes TR0825		(1) 5 June 2010 (2) 13 June 2002	(1) KBRG meeting (2) EGP & DG	(1) TR0825 (2) TR02X
Littlestone Warren - St Mary's Bay south	TR02Y, includes TR0826	SSSI	(1) 22 May 2023 (2) 5 June 2010 (3) 13 June 2002	(1) DS (2) KBRG meeting (3) EGP & DG	(1) TR0826. (2) Occasional along the boundary of the upper beach shingle with Coast Rd path, from south end of 1km square at least as far north as TR 08794 26196 . 589 [includes record at TR 0876 2614 by JS]. (3) TR02Y.
Sandwich Royal St George's	TR35P, includes TR3458, TR3558, TR3559	SSSI	(1) 13 June 2018 (2) 26 June 2013 (3) August 2001 (4) 1991-99 (5) 4 August 1996 (6) 2 March 1983 (7) After 1970, before 1981	(1) & (2) SB (3) GL (4) EGP (5) FR (6) ACH (7) Philp (1982)	(1) TR3558. (2) Frequent on large bare sand area at TR 35760 59082. (3) TR 342 589 [habitat since destroyed]. (4) TR35P. (5) TR3559, on shore, by toilet. (6) TR 355 585, TR 358 585. (7) TR35P.
Sandwich Bay - Prince's golf links	TR3560	SSSI	2 March 1983	ACH	TR 353 605, TR 354 605, Sandwich & Pegwell Bay survey.
[Royal Cinque Ports Golf Links, Sandwich]	[TR3755]		[2 March 1983]	[ACH]	[TR 376 557, Sandwich & Pegwell Bay survey.] {Grid reference is incorrect, as out to sea.]
Sandwich Bay Estate	TR35T		(1) 1991-99 (2) After 1970, before 1981	(1) EGP (2) Philp (982)	(1) & (2) TR35T.
Sandwich Bay	TR35U		(1) 1991-99 (2) After 1970, before 1981	(1) EGP (2) Philp (982)	(1) & (2) TR35U.
Sandwich Bay	TR3463	National Nature Reserve, country park	22 June 1998	JS	TR 341 632.
Sandwich Bay - north of Prince's golf links	TR36K, includes TR3561	SSSI	(1) 8 July 2021 (2) 26 June 2013 (3) 5 June 2004	(1) & (2) SB (3) EGP	(1) Alongside footpath by Princes golf course at TR 35298 61010. (2) Quite frequent on bare sand patches in dunes. e.g. at TR 352 610 (3) TR36K.

Vulpia unilateralis (L.) Stace (Mat-grass Fescue)

vc 15, may be gone from vc16

Rarity / scarcity status

Vulpia unilateralis is a small, inconspicuous grass of southern England, growing on bare chalk or limestone or open grassland in similar geological contexts, sometimes at waste places or roadsides. Views as regards status vary[955]; it is considered to be possibly native, although some occurrences may be introductions. Its threat status in both England and Great Britain as a whole is of 'Least Concern'. In Kent, it is **rare**.

Account[956]

This grass was recognised in Britain fairly late on, and so is not mentioned in Hanbury & Marshall (1899). Except for the first record (Lincolnshire, 1903), the earliest British records are from Kent. In 1906, a specimen was collected by F. Escombe from Wye Agricultural College garden, where it was found in a row of grass labelled *Festuca eu-ovina* grown from seed supplied by Kew and must have been a contaminant. A further plant was collected there in 1907. Then in 1909 Lady Davy found it growing in sandy soil at Littlestone not far from a railway (presumably the New Romney Branch) with native species such as *Catapodium rigidum* (Fern-grass) and *Catapodium marinum* (Sea Fern-grass). The potential native status of this appears better here, although the sandy coastal habitat is exceptional in British occurrences (albeit growth on sand dunes is known on the Continent); it has not been seen here since.

Culand Pit. Photo by Lliam Rooney, 3 June 2017.

What has turned out to be a more characteristic habitat, viz. barish ground on chalk, was exemplified by the next records to be made, a series by Peter and Joan Hall in 1959:

- On bare chalk patches in old parts of the big chalk pit at Hollingbourne Hill[957], closely associated with *Catapodium rigidum* (Fern-grass), 'looking very native!'[958]
- On bare chalk patches at the foot of the downs near Trottiscliffe, again closely associated with *Catapodium rigidum*; site described by Francis Rose as 'Broken chalky bank, between arable and downland, TQ 628605, above Wrotham Water'.
- At Halling Warren, a rough open chalky field, TQ 698 656.

To these they added in 1961 a sighting on waste chalk ground, topsoil by Halling chalk pit.[959]

Plants could not be found at Hollingbourne or Trottiscliffe during the period of survey, 1971-80, for Philp (1982). Five tetrad records were made, however: the floor of a chalk quarry at Stone; bare chalky areas at Halling and Burham; a ragstone quarry near Aylesford; and, anomalously, in a garden, after use of organic manure. A similar number of tetrad records were made in the survey, 1991-2005, published as Philp (2010), all in or adjacent to chalk quarries: at Greenhithe, Snodland, Burham, Cuxton and Rochester. These were not the only finds during this period, but do emphasise how closely the favoured habitat of bare chalk was associated with the sites of the former north west Kent cement industry. Since then, sites have become more overgrown, some have been developed, and others, viewed as having development potential, have been secured with pallisade fencing so as to prevent access. After 2010, only two sites with *Vulpia unilateralis* have been recorded: Culand and Peter's Pits on the chalk of the Medway Gap. That is not to say that more do not exist, but even setting aside sites with access issues, this is a grass which is so inconspicuous that it can hide in plain sight.

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[955] *Plant Atlas 2020* (2023) says 'There is little consensus on its status in Britain. It was mapped as a neophyte in the 2002 *Atlas*, whilst others (e.g. Stace, 2019) argue that it is probably native. Given its habitats and behaviour it is probably best treated as a rare casual that is persistent in a few sites, and is mapped as an alien here'. Kent occurrences, on the other hand, seem more persuasive of a native species of bare chalk habitats, the extent of which was opened up by chalk quarrying.

[956] For the history and recognition of this species, including in a Kent context, the most important sources are:
(1) C.A. Stace (1961). *Nardurus maritimus* (L.) Murb. in Britain. *Proc. B.S.B.I.* **4**: 248-261.
(2) C.A. Stace (1962). A note on *Nardurus maritimus* in Kent. Kent Field Club Bulletin **7**: 11-14.

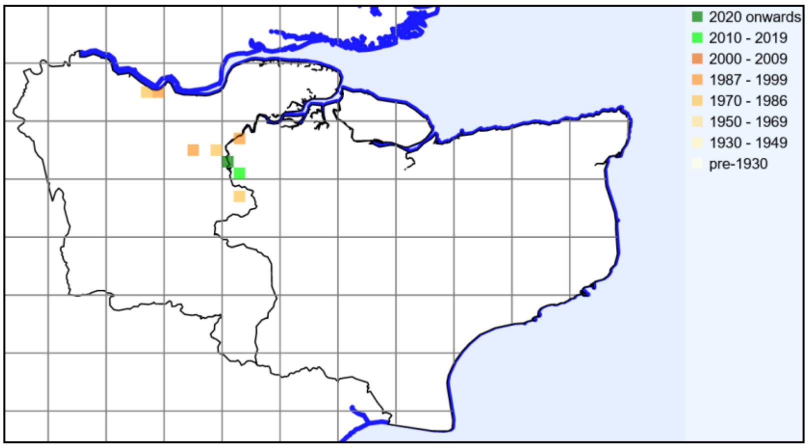
[957] There have been pits on both sides on the road, but it seems as though the western side, in TQ8455, was being referred to.

[958] Letter, Joan Hall to Francis Rose, 26 May 1959.

[959] This appears to have been White Pit, the *Teucrium botrys* quarry, at TQ6964/65.

Culand Pit. Photo by Lliam Rooney, 3 June 2017.

Vulpia unilateralis is an annual, germinating in spring, flowering early and then disarticulating, usually by the end of May or early June[960]. It is likely that any carry-over of seed after the germination period is limited: Spanish studies[961] of a semi-arid community on gypsum showed a seed-bank density of 1751 seeds per m^2 in September reducing to 208 seeds per m^2 in April; at least some of this 88% seed-bank reduction will have been the result of germination. So far as concerns the concept of a seed-bank in the context of the Kent chalk pit occurrences, the absence of a meaningful soil in many of its bare chalk locations suggests that seed must become lodged in small surface cracks or entangled in moss growth. The openness of its habitat would indicate an intolerance of competition and presumably also a predilection for spring light and warmth to enable it to complete its early life cycle before a parching summer. It generally grows in situations which are very dry in summer, but some of the quarry floor locations must at least be seasonally damp.



Kent *Vulpia unilateralis* tetrad records to 2024, from BSBI database

Evidence of rabbit presence was noted at Peter's and Upper Culand Pits. This is likely to be beneficial in disturbing the ground, reducing competition from perennial establishment (notwithstanding which, scrub management appears helpful in reducing encroachment).

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[960] Olano, J.M., Caballero, I., Loidi, J. & Escudero, A. (2005). Prediction of plant cover from seed bank analysis in a semi-arid plant community on gypsum. *Journal of Vegetation Science* **16**: 215-222.

[961] Pearman, D.A. (1994). Vulpia unilateralis (L.) Stace Mat-grass fescue. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. (1994) *Scarce Plants in Britain.* JNCC, Peterborough.

Whether there is any loss through rabbits grazing was not observed, but Leicestershire experiments indicate that *Vulpia unilateralis* thrived on limestone quarry floor plots where fertiliser was applied, whether rabbits were excluded or not.[962]

The associated flora is characteristic of dry, open, calcareous ground with minimal soil. Listings are given in Stace (1961)[963] for sites at Hollingbourne and Halling Warren, with species ordered by constancy of occurrence and noted as regards percentage cover in the quadrats examined. For Trottiscliffe, species included *Catapodium rigidum* (Fern-grass), *Linum catharticum* (Fairy Flax), *Poterium sanguisorba* (Salad Burnet), *Taraxacum laevigatum* [this was an aggregate species of Dandelion covering sect. *Erythrospermum*], *Medicago lupulina* (Black Medick), *Origanum vulgare* (Wild Marjoram), *Thymus drucei* (Wild Thyme), *Lotus corniculatus* (Common Bird's-foot-trefoil), *Plantago lanceolata* (Ribwort Plantain), *Bellis perennis* (Daisy), *Pilosella officinarum* (Mouse-ear-hawkweed), *Brachypodium sylvaticum* (False-brome). For Halling Warren, species included *Fragaria vesca* (Wild Strawberry), *Viola hirta* (Hairy Violet), *Lotus corniculatus* (Common Bird's-foot-trefoil), *Brachypodium sylvaticum* (False-brome). Excluded from both listings as given here are species of low constancy, plants of rare occurrence, less than 1% cover, and mosses.

Peter's Pit, habitat. Photo by Geoffrey Kitchener, 26 May 2022

More recent surveys of associated flora provide a similar picture. At Peter's Pit (2022), *Catapodium rigidum* and *Poterium sanguisorba* were universal constants, followed by *Linum catharticum* and *Origanum vulgare*. At Upper Culand Pit (2017), *Pilosella officinarum* and *Thymus drucei* were more or less universal constants, followed by *Catapodium rigidum*. *Clinopodium acinos* (Basil Thyme), while not so widespread, very much adopted similar bare habitats at Upper Culand Pit and could almost be regarded as an indicator species for *Vulpia unilateralis*; this association was also noted at Peter's Pit (2023).

As for identification, *Vulpia unilateralis* can be mistaken for depauperate specimens of other *Vulpia* species, but has a distinctly one-sided inflorescence and three exserted anthers (one, non-exserted, in other Brtish *Vulpia* species). The upper glume is twice as long as the lower (cf. 3-4 times as long in *V. myuros*).

Culand Pit, habitat. Photo by Lliam Rooney, 3 June 2017. The grass was present both on the bare chalk of the bluff in the immediate foreground and on the pit floor beyond.

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[962] Davis, B.N.K., Lakhani, K.H. & Brown, M.C. (1993). Experiments on the effects of fertilizer and rabbit grazing treatments upon the vegetation of a limestone quarry floor. *Journal of Applied Ecology* **30**: 615-628.

[963] See earlier footnote.

Site	Grid reference	Site status	Last record date	Recorder	Comments
Stone	TQ57S		27 June 1975	BSBI meeting	Chalk quarry floor, Atlas Stone Co pit. [Previous year in hundreds; site destroyed by tipping, 1976.]
Bluewater shopping centre	TQ57W		27 May 2001	JP	Several colonies in bare chalk of cliffs along eastern and southern margin. Presumably TQ5873, although recorded at tetrad level.
Bluewater pit	TQ57X		25 May 1992	JRP & EGP	[Since developed.]
North of Harvel	TQ6564		17 June 1988	NCC England Field Unit	TQ 656 643, Lenniker Wood [aerial views of 1990 show a scrubbing dry valley grassland slope with some chalk exposures.
Halling	TQ66X		After 1970, before 1981	Philp (1982)	Bare chalky area.
Ditton quarry	TQ7157	Ditton Parish Council local nature reserve	(1) 15 June 1997 (2) 1996	(1) KFC meeting (2) JP	(1) TQ 715 575, Ditton Court quarry, found GK, gridref reported JS, DCa. (2) TQ 715 575.
'Near Aylesford'	TQ75I		After 1970, before 1981	Philp (1982)	[In some respects a puzzling record, given as a ragstone quarry at TQ75I in Philp (1982) with a monad reference of TQ7256 in the BSBI database (origin? Quarrying in this monad was very limited and short-lived); but subsequent ragstone quarry records have been for Ditton, TQ75D].
Snodland / Burham[964]	TQ76B, includes TQ7162, TQ7163	Peter's Pit SSSI, KWT reserve	(1) 14 June 2023 (2) 26 May 2022 (2) 1991-99 (3) After 1970, before 1981	(1) GK (2) GK (2) EGP (Philp, 2010) (3) Philp (1982)	(1) (a) TQ 71971 63092, northeastwards for c.10m (where abundant). Semi-bare or mossy chalk surface of former access ramp from Peter's Pit up towards higher ground now being developed. Associated spp: *Betula pendula* (seedling), *Carlina vulgaris, Catapodium rigidum, Euphrasia nemorosa, Galium parisiense, Lotus corniculatus, Origanum vulgare, Poterium sanguisorba, Viola hirta*. (b) TQ71811 62991, on small chalk ridge south east of western lake on floor of Peter's Pit, with *Galium parisiense.* (c) Widely scattered in Peter's Pit reserve, e.g. at TQ 71771 63094 and vicinity where growing tall on chalk in cut scrub, with compact *Holcus lanatus, Lotus corniculatus, Poterium sanguisorba, Rubus* spp., *Vulpia bromoides*. (2) Widely scattered in Peters Pit. Sample locations (a) TQ 7182 6279, eleven plants counted on slope of s-facing bluff of bare chalk, very little other vegetation, but associated spp were small plants of *Catapodium rigidum, Clematis vitalba, Cornus sanguinea, Hypericum perforatum, Inula conyzae, Ligustrum vulgare, Linum catharticum, Origanum vulgare, Poterium sanguisorba, Taraxacum* sect. *Erythrospermum,*

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[964] Eric Philp's recording cards are for each tetrad, irrespective of whether a tetrad may include both vice counties, so one cannot tell whether the TQ67B records are from the Snodland (West Kent) or Burham (East Kent) side of the Medway, although in this case it may be assumed Burham.

					Veronica arvensis. (b) TQ 7175 6278, several plants in and around vehicle ruts on chalk in base of pit, soil fairly bare but but associated spp were small plants of *Bellis perennis, Catapodium rigidum, Epilobium parviflorum, Origanum vulgare, Poterium sanguisorba, Taraxacum* sect. *Erythrospermum.* (c) TQ 71628 62754, numerous plants on chalk of slightly undulating quarry floor, ground fairly open but with very low cut scrub, plants mostly small but taller where sheltered by young scrub/seedlings, up to 14cm; associated spp *Bellis perennis, Catapodium rigidum, Cornus sanguinea, Crataegus monogyna, Linum catharticum, Origanum vulgare, Poterium sanguisorba, Prunella vulgaris, Vulpia bromoides.* (d) TQ 7160 6274, a few small plants on near bare chalk floor of quarry, associated spp small plants of *Catapodium rigidum, Plantago major, Poterium sanguisorba, Prunella vulgaris, Taraxacum* sect. *Erythrospermum, Viola hirta, Viola riviniana.* (e) TQ 71551 62754, small plants on near bare chalk rabbitted floor of quarry, associated spp small plants of *Catapodium rigidum, Linum catharticum, Poterium sanguisorba, Prunella vulgaris, Taraxacum* sect. *Erythrospermum, Veronica serpyllifolia, Viola hirta, Viola riviniana.* (f) TQ 7172 6273, scattered plants on open undulating near-bare chalk floor of quarry with associated spp *Catapodium rigidum, Linum catharticum, Origanum vulgare, Poterium sanguisorba, Prunella vulgaris, Viola hirta.* (2) TQ76B, chalk quarry. (3) TQ76B
Eccles/Burham	TQ76F, includes TQ7361	Culand Pit, SSSI, KWT-managed reserve	(1) 3 June 2017 (2) 5 August 2016 (2) 1991-99	(1) GK & LR (2) GK (2) EGP (Philp, 2010)	(1) Upper Culand Pit, (a) Still present at TQ 7378 6187 location as at 5 August 2016, but many more numerous plants, mostly very small. (b) TQ73781 61889, a ledge at the same level as the 5 August 2016 site, but further north east. Near bare chalk surface, rabbitted, associated species included *Pilosella officinarum, Thymus drucei, Catapodium rigidum*. (c) TQ 73811 61841, floor of chalk quarry, top of low bank, south-facing, semi-bare ground, only a few plants. Associated spp included *Catapodium rigidum, Pilosella officinarum, Thymus drucei, Bellis perennis*. (d) TQ 73801 61869, on floor of

					chalk quarry, 47m alt., fairly flat, only slightly raised area, less open ground than the ledge sites, some moss. Associated spp included *Pilosella officinarum, Bellis perennis, Thymus drucei, Poterium sanguisorba.* (e) TQ73838, very small patch on mossy flat of chalk quarry floor. (f) TQ73814, a 1ft square patch on semi-bare ground on top of very shallow north-south aligned chalk bank on quarry floor. Associated spp included *Poterium sanguisorba, Pilosella officinarum, Thymus drucei.* (g) TQ73826 61777, one plant on the top of a steep north-facing chalk slope in quarry, its site facing back to the south behind the crest, 54m alt. Semi-bare ground, associated spp included *Thymus drucei, Pilosella officinarum, Catapodium rigidum.* (2) Upper Culand Pit, (a) TQ 7378 6188, chalk ledge, several metres higher than nearby site, semi-bare, rabbitted – c. 20 small dried-up disintegrating plants. Associated spp. included *Clinopdium acinos* (b, TQ7378 6187, c.25 dried-up fragmenting plants on small flat chalk promontory, semi-bare and rabbitted, eastern aspect. Associated spp *Clinopodium acinos, Pilosella officinalis, Catapodium rigidum, Thymus* sp. (2) TQ76F, chalk quarry.
Cuxton	TQ76I, includes TQ7267		(1) 2003 (2) 1991-99 (3) 1995	(1) RS (2) EGP (Philp, 2010) (3) JW & JP	(1) TQ 724 679, pre-deveopment ecological impact assessment. (2) TQ76I, chalk quarry. Presumably the southern part of Wickham Works chalk pit at TQ7267 developed from 2007 for housing as Medway Gate. [GK recollects *Vulpia* here on the bare chalk mounds lining the internal quarry road slopes.] (3) TQ 724 680, described as No 3 Pit, Cuxton.
Rochester (Strood)	TQ76J		12 June 2000	EGP (Philp, 2010)	TQ76J, chalk quarry. Presumably the northern part of Wickham Works chalk pit

Kent Rare Plant Register
Species accounts Part W-Z

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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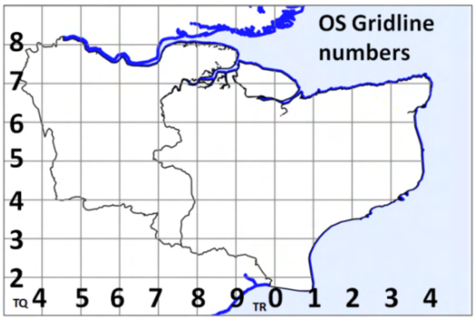
Kent rare plant register

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the text:

Recorders' initials:

AL Alex Lockton
AF Andrew Foster
ANG A.N. Gagg
AW Tony Witts
AWi Anne Wilks
BB Brian Banks
BC Bryony Chapman
BS Barry Stewart
BW Brian Woodhams
CC Chris Cook
CO Colin Osborne
DC Danny Chesterman
DG Doug Grant
DM Daphne Mills
EGP Eric Philp
FB Fred Booth
FR Francis Rose
FRG Bob Gomes
GK Geoffrey Kitchener
IF Irene Folliot
IT Ian Titley
JBr Jon Bramley
JOM Owen Mountford
JP Joyce Pitt
KBRG Kent Botanical Recording Group
KF Kathy Friend
KFC Kent Field Club
LR Lliam Rooney
MG Mark Gurney
MGr Morwenna Griggs
NS Nick Stewart
OL Owen Leyshon
PH Peter Heathcote
RL Richard Lansdown
RM Richard Moyse
RMB Rodney Burton
SB Sue Buckingham
SP Sue Poyser
TI Tim Inskipp

Wahlenbergia hederacea (L.) Rchb. (Ivy-leaved Bellflower)

vc 15; gone from vc16

Rarity / scarcity status

Wahlenbergia hederacea is a creeping perennial of damp acid habitats in heaths, moorland and woodland, mostly in the west of the British Isles, absent from central and east England. Although present in the Ashdown Forest and neighbouring Sussex High Weald woodland, this is exceptional in the context of its avoidance of the drier eastern counties, and it is barely found in Kent. A comparison of English data over the periods 1930-1969 and 1987-1999 showed that its area of occupancy had declined so that there was a calculated 21% reduction in the likelihood of recording the species, so that its English status is N**ear Threatened**; this is also its threat status in Great Britain. In Kent it is **rare.**

Sissinghurst. Photo by David Steere, 15 August 2021

Account

The first published record of the species in Kent was by Colin Milne and Alexander Gordon in *Indigenous Botany* (1793), from which it appears that it was then surprisingly widespread in north west Kent: 'We found it in great abundance growing in the bushes on the bogs at *Caesar's-Camp* near *Bromley* in *Kent*; on the bogs on *Hayes* and *Bromley-Common*; and in the woods about *Chevening*, *Nokeholt*, *Westerham*, *Farnborough*, *Down* and *Cudham*. The species survived in the area to be mentioned in Alexander Irvine's The London Flora (1838) (Bog, near Keston Cross, about two miles beyond Bromley, on the Tunbridge road') and was collected by John Stuart Mill by the lower pond at Keston Heath. This location was apparently still extant c. 1880. But at the time of the *Woolwich Surveys* (1909) it was considered probably extinct in the whole district.

Sissinghurst. Photo by David Steere, 15 August 2021

Hanbury & Marshall (1899) did not know of it elsewhere, although they considered the countryside around Tunbridge Wells to be suitable. Marshall, however, wrote up its presence at Seal Chart when providing the botanical account for the *Victoria County History of Kent (*1908).

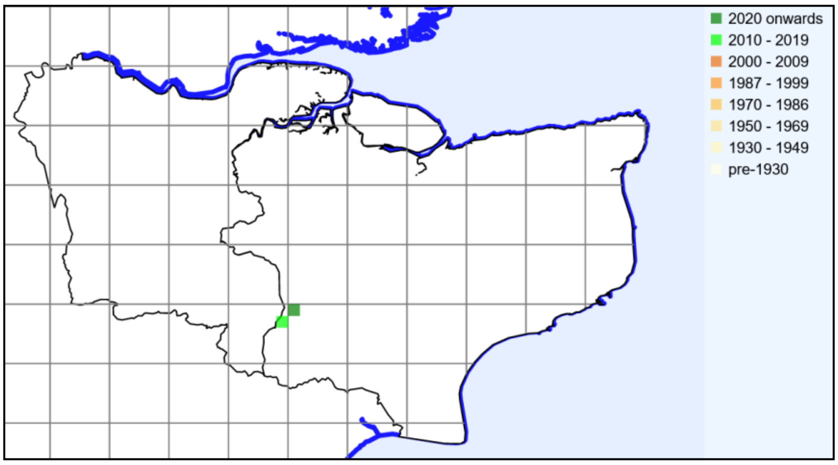
Three new localities were found in the 1940s. At Bedgebury Forest it was found by Francis Rose and Cyril West in 1944 by a small stream in a young conifer plantation; this site became overgrown and was considered no longer viable for the plant, probably by the late 1950s. Two localities were found at Sissinghurst. One was at Sissinghurst Park Wood (north west of Sissinghurst Castle) in 1948; and the other was at Roundshill Park Wood (south east of Sissinghurst Castle) in 1949. Both are on Tunbridge Wells Sandstone and have fairly recent records as well, not restricted to one spot (including an outlier in nearby Bull Wood).

The only new record since seems to be a discovery in the course of a KFC field meeting led by Francis Rose in 1962 at Birch Wood Bethersden, TQ9140, in a heathery ride on a sandy outcrop, the first Kentish find on Weald Clay. Philp (1982) and (2010) reported two and one tetrad records respectively, but one of the former was at Scotney Castle and, although in the administrative county of Kent, was located in vc14, West Sussex, for botanical recording purposes. Our recent records are confined to the Sissinghurst area.

While it is not the only damp-loving western species which has a place in the Kent and Sussex Weald, it has not done so in the microclimate of wealden gills, as has *Dryopteris aemula* (Hay-scented Buckler-fern), but rather in damp acid woodland rides or boggy woodland streamsides. It does not appear with us in open short-turfed pasture or grass bank in the open as in the west country; and in Kent presumably partial shade has an increased importance in maintaining humidity. It requires permanently moist acid infertile soil, without being waterlogged or stagnant. It is a perennial and spreads via prostrate rooting stems as well as by seed, which requires light for germination.

Sissinghurst. Photo by David Steere, 15 August 2021

Associated flora at Sissinghurst Park Wood (where abundant in the 1940s at a damp ride on sandy loam, although this ride was since gravelled, 1979) noted by Francis Rose included *Centaurium pulchellum* (Lesser Centaury), *Linum radiola* (Allseed), *Lythrum minima* (Chaffweed), *Mentha arvensis* (Corn Mint) and *Oreopteris limbosperma* (Lemon-scented Fern) – a remarkably rich assemblage. In the same woodland complex in 2021, along a faint path in well-lit chestnut coppice, patches of *Wahlenbergia* were accompanied by *Agrostis canina* (Velvet Bent), *Hypericum humifusum* (Trailing St John's-wort), *Lythrum portula* (Water-purslane), *Potentilla erecta* (Tormentil), *Sagina procumbens* (Procumbent Pearlwort), and *Teucrium scorodonia* (Wood Sage). Another site here, in chestnut coppice by a stream in 2012 produced *Cardamine flexuosa* (Wavy Bitter-cress) and, again, *Hypericum humifusum* and *Potentilla erecta*. Overall, these species are generally indicative of damp acid woodland with some light exposure.



***Wahlenbergia hederacea* Kent records to 2024 mapped at tetrad level, from BSBI database.**

Wahlenbergia hederacea is not readily confused with any other British species. Threats to its continuance in Kent include climate change, given that it is here on the edge of its British range (Kent records being the easternmost in the British Isles), and the surfacing of woodland and forestry rides.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Sissinghurst, Bull Wood	TQ7937	Access land	26 May 2015	GK	TQ 7974 3796, patch scattered in area c. 1 x 2m, sunny, south-facing terrain sloping towards damper area in woodland clearing, vegetated with semi-open ground presumably affected by winter inundation, Bull Wood. Associated species *Potentilla erecta*, *Prunella vulgaris*, *Ranunculus flammula*, *Juncus bulbosus*.
Sissinghurst Park Wood	TQ83E, includes TQ8038	SSSI	(1) 12 August 2021 (2) 15 August 2012 (3) 15 August 2010 (4) 1991-99 (5) After 1970, before 1981	(1) KBRG meeting (2) KBRG meeting (3) SP & DG (4) EGP (5) Philp (1982	(1) At least twelve flowering patches or small groups of plants along and near a faint path in well-lit chestnut coppice from TQ 80030 38533 to TQ 80036 38534. Associated species: *Lythrum portula, Agrostis canina, Sagina procumbens, Teucrium scorodonia, Potentilla erecta* and *Hypericum humifusum.* (2) (a) On a damp path under sweet chestnut coppice, patches at TQ 80073 38647 and TQ 80036 38552, private woodland. (b) Patch 1 x 1 metre at TQ 80086 38681 by stream under sweet chestnut coppice with *Potentilla erecta, Cardamine flexuosa* and *Hypericum humifu*sum, private woodland. (3) Sissinghurst Park Wood, a patch 1m x 1m on path at TQ 80064 38655 and a further small patch on path at TQ80032 38566. (4) TQ83E, Roundshill Park Wood, woodland ride. (5) TQ83E.
Sissinghurst Park Wood	TQ8037		27 July 1979	FR	Further south than FR's previous finds (presumably in TQ8038).

Wolffia arrhiza (L.) Horkel ex Wimm. (Rootless Duckweed)

vc 15; perhaps gone from vc16

Rarity / scarcity status

Wolffia arrhiza is a minute native aquatic plant, very local in ponds and ditches in southern England and Wales. It is treated as a **nationally scarce** species and **Vulnerable** to the risk of extinction Great Britain as a whole, albeit of 'Least Concern' in England. However, our knowledge of current distribution and assessments of risk status based on this have been thrown into disarray by the discovery that a very similar alien species of duckweed *Wolffia columbiana* (Columbian Water-meal) has invaded supposed British *Wolffia arrhiza* habitat (Lansdown *et al*., 2022)[965]. It is not known how far the alien species has supplanted *Wolffia arrhiza* or is co-existing with it, although at one stage it was thought that they may perhaps have been found together in Kent. Assessing the position is far from straightforward because of the difficulties in separating the two species. *W. arrhiza* is or was **scarce** in Kent, so far as we are aware, but it is now questionable how far it remains present at all, and when it was replaced. Or, indeed, whether it was ever present in Britain at all, but always mis-identified from *W. columbiana*[966]. '*W. arrhiza*' is listed as a Kent axiophyte and so is indicative of good habitat (this is probably a fair assessment of the habitat, even though the species may be mis-attributed).

South of Kenardington. Photo by Lliam Rooney, 27 June 2012

Account

The first Kentish record of *W. arrhiza* is given in Hanbury & Marshall (1899) as made by George Gulliver in 1866, although the publication cited for this does not appear to contain such a record; nevertheless Hanbury and Marshall also quoted from a letter by Gulliver confirming that he had found it plentifully in Kentish places which are likely to have been along the Stour valley. We have in recent times thought of the species in Kent as primarily one of Romney Marsh, and in that region it was first noted by Hanbury, near Lydd, before 1899. There are many East Kent records since, with a few West Kent records from Wealden ponds, and Francis Rose summarised it in his manuscript *Flora of Kent* as a native plant of 'Ponds and ditches: rare, but locally abundant in a few places'.

It was thereafter regarded as a declining species, with a 56% drop (25 down to 11) in tetrad records between Philp (1982) and Philp (2010). This is against an apparent increase in the Stour catchment; but as this has been a traditional area for occurrence, it may represent recording effort rather than an influx of unrecognised *W. columbiana.* However, this decline was not affirmed to that degree by our records from 2010 onwards, which amounted to 21 tetrads (23 monads), most of which lay across Romney Marsh, extending into the Upper Levels. (These records go no later than 2019.) A possible interpretation of the position is that 2010-19 recording has been more effective than the Philp (2010) survey (we have found other instances of this, where apparent losses shown by Philp (2010) have not subsequently been confirmable).

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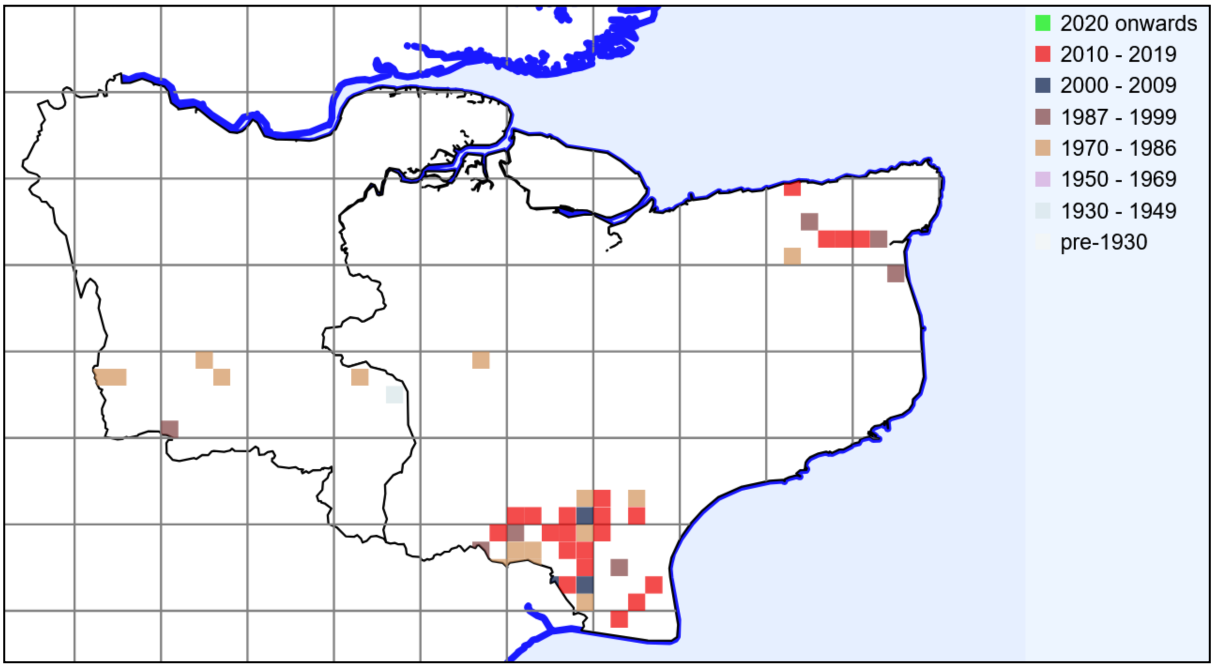
[965] Lansdown, R.V., Kitchener, G. & Evans, J. (2022). *Wolffia columbiana* and *W. globosa* new to Britain. *British & Irish Botany* **4**: 14-26. This paper considered it possible that *W. columbiana* had been present in Britain for some time, even though the first European record was in 2013. The relatively late appearance of first *W. arrhiza* records on the Pevensey Levels of East Sussex (1994) and the Gwent Levels (1982), coupled with a general increase in national *W. arrhiza* records in the 1990s might accordingly have been indicative of an unrecognised invasion by *W. columbiana.* The possibility that we might never have had *W. arrhiza* as a native species at all was subsequently developed in a 2024 re-appraisal – see below.

[966] Lansdown, R. (2024). A re-appraisal of Wolffia in Britain. *BSBI News* **156**: 51-54. Confirmation of *W. arrhiza* from historic herbarium specimens has presented practical difficulties, but plants so labelled from Surrey (1868) and Middlesex (1870) have now been re-identified as *W. columbiana.*

The 2023 issue of this register assumed (in the light of Lansdown, 2022 – see footnotes) that it might be reasonable to treat as *W. arrhiza* all records in Francis Rose's Flora (which go up to 1965)[967] as preceding the appearance of South American *W. columbiana.* Similarly, but with less certainty, as regards Philp (1982), in which a survey from 1971 to 1980 recorded *W. arrhiza* in 25 tetrads, finding it to be very local and scarce but sometimes in abundance, in marsh dykes and occasionally ponds.

Now, however, we cannot make any such assumptions, and it seems appropriate to treat all previous Kent *W. arrhiza* records as uncertain. Determinations of *W. columbiana* (first identified in Kent in 2021) are listed in this account, even though as a presumed introduction it does not fulfil the criteria to be treated as a rare plant register species.

***'Wolffia arrhiza'* Kent records to 2024 mapped at tetrad level, from BSBI database.**



This distribution map accordingly shows previously presumed native (but now uncertain) tetrad records of '*W. arrhiza*'. (It does not include all of Francis Rose's as these have not been included in the BSBI database and may not be convertible to grid-references in any event.) The map is likely to understate occurrence in the Stour catchment, and shows former presence in a number of Wealden ponds which later botanising has not picked up. There is also a notable paucity of records from TR02, Romney Marsh, which may be an artefact of data availability. *Wolffia* had been known from here, as Mountford & Sheail[968] refer to it being listed in a survey by Francis Rose in 1959 at TR0325 (the old moat, Old Romney), whereas a repeat survey in 1981 failed to find, apparently due to arable conversion and under-draining in the 1960s, a widespread change at Romney Marsh that will have affected general suitability of ditches for *Wolffia*.

W. columbiana was first confirmed in Kent by Richard Lansdown in the following localities. Those for 2021 are given in Kent Botany (2022) and Lansdown *et al.* (2022) cited above; those for 2023 derive from follow-up visits by him in that year. They were largely sampled on the basis of seeking to investigate a fairly wide spread of known *Wolffia* sites.

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[967] In the Stour catchment at Preston Marshes, Fordwich Marshes, Plucks Gutter, Stodmarsh, Grove Ferry; in the Weald near Marden; in Romney Marsh and the associated levels at Windmill Channel (Rolvenden Layne), Kenardington, Shirley Moor, Newchurch, Snargate, Stone, Ruckinge.

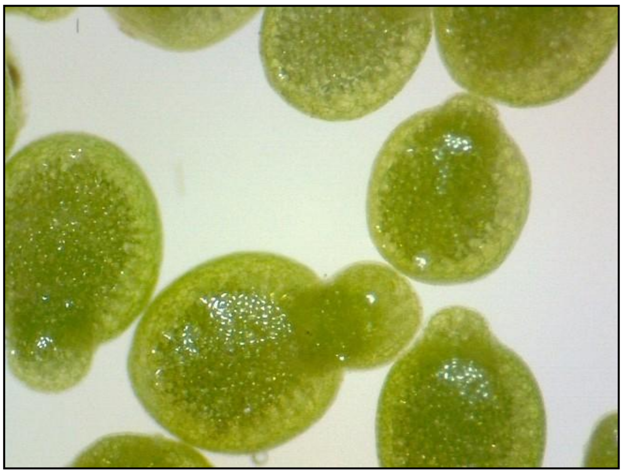
[968] Mountford, J.O. & Sheail, J. (1989). *The effects of agricultural land use change on the flora of three grazing marsh areas.* NCC Focus on Nature Conservation report 20.

	Presence of *W. columbiana*	**Location**	**Collector**	**Date**	**Previous record of '*W. arrhiza*'**
1	Confirmed	TR 276 631, fishing lake by the Stour below **Plucks Gutter**	AL	14 October 2021	17 Jul 2019, by GK, abundant, with *Spirodela polyrhiza.*
2	Confirmed (originally supposed also to be with *W. arrhiza,* although the presence of the latter is no longer upheld).	TQ 97843 31262, ditch on the Dowels sheep pasture near **Kenardington**	SB	16 October 2021	27 June 2012, by KBRG meeting, at TQ 97814 31205, in still water of ditch with much emergent vegetation, amidst *Lemna minuta*, *Lemna trisulca* and *Hydrocharis morsus-ranae*. There have been other records in TQ9731, before and after this.
3	Confirmed	TQ 97924 31284, ditch on the Dowels sheep pasture near **Kenardington**	SB	16 October 2021	See above.
4	Confirmed	TQ 92118 30103, roadside ditch near **Reading Street** (recently cut and cleared, so only very little *Wolffia* present)	SB	16 October 2021	29 August 2019, by SB, in profusion in a roadside ditch at TR 9212 3010.
5	Confirmed	TR 01059 28444, road-side pond near **Brenzett Corner**	SB	16 October 2021	12 September 2019, by SB & OL, at the margin of a pond at TR 0105 2847.
6	Confirmed	TR 04328 31885, ditch in arable, Wills Lane, near **Newchurch**	SB	16 October 2021	4 October 2019, by SB & OL, in a ditch at TR 0433 3187, with *Hydrocharis morsus-ranae.*
7	Confirmed	TR 07638 22856, ditch at edge of arable, **Greatstone**	SB	16 October 2021	5 October 2019, by OL, abundant in an arable ditch adjacent to the shingle near to Greatstone Primary School, Greatstone, TR 07654 22848.
8	Confirmed	TR 0187 3169, **Bainbridge Farm**	RVL	2 [21?] September 2023	24 August 2014, KFC meeting, at TR 01563 31904, dike on sheep pasture.
9	Cpnfirmed	TR 92118 30103, **Reading Street**	RVL	21 September 2023	See 4 above
10	Confirmed	TQ 97843 31262, **Kenardington**	RVL	21 September 2023	Se 2 above
11	Confirmed	TQ 97924 31284, **Kenardington**	RVL	21 September 2023	See 2 above
12	Confirmed	TR 01059 28444**, Brenzett Corner**	RVL	21 September 2023	See 5 above
13	Confirmed	TR 04328 31885, Wills Lane, **Newchurch**	RVL	21 September 2023	See 6 above
14	Confirmed	TR 07638 22856, **Greatstone**	RVL	21 September 2023	See 7 above
15	Confirmed	TR 071 343, Royal Military Canal, **Giggers Green Bridge**	RVL	6 October 2023	-

If there has been, or is, competition between *W. arrhiza* and *W. columbiana*, it is not yet clear what any competitive advantage for the latter may be. The two species' ecological amplitude appears very similar, except that Landolt (1994)[969] considers *W. columbiana* capable of withstanding lower cold temperatures (-12°C for the lowest mean temperature of the coolest three months, as compared with -8°C for *W. arrhiza*) albeit that these extremes would not have much relevance for Kent.

Wolffia habitat at the Dowels, where *W. columbiana* was subsequently recorded in this ditch complex in 2021.
Photo by Geoffrey Kitchener, 27 June 2012

The presence of *Wolffia* among other duckweeds may be suspected from its size (*Wolffia* plants are only about a millimetre across, but one needs to see a number of them together in order to distinguish from young *Lemna* spp.) and then tested for by rubbing together between finger and thumb when their grittiness should be apparent. *W. columbiana* appears paler green than *W. arrhiza* and when a frond is viewed against the light, it gives the appearance of a wide translucent border about 1/5 the width of the frond, rather than the darker, more uniformly opaque frond of *W. arrhiza.* While differentiation has also been stated on the basis of their side-on appearance, with *W. columbiana* having a domed top of which relatively little is flattened and *W. arrhiza* a more comprehensively flattened one, the extent to which this is reliable is unclear. A comparison of their characters, as also those of other *Wolffia* species including *W. globosa* (Asian Watermeal) - which also now has been recorded in Britain - is given in Lansdown *et al* (2022).



Wolffia columbiana, from the Dowels, showing translucent border Photo by Sue Buckingham, 16 October 2021

'W. arrhiza' has been taken to be a plant of still water, especially species-rich grazing marsh ditches which are normally neutral and rich in nitrogen, but which may be susceptible to domination by reeds and other emergent vegetation if not maintained with banks grazed or mown. Such habitats are described[970] as including other Lemnaceae and *Hydrocharis morsus-ranae* (Frogbit), growing over submerged *Ceratophyllum demersum* (Rigid Hornwort) and '*W. arrhiza*' has previously been regarded as particularly common where *Lemna gibba* (Fat Duckweed) and *Spirodela polyrhiza* (Greater Duckweed) are abundant, but where *Lemna trisulca* (Ivy-leaved Duckweed) is rare or absent (although the latter has been seen in company in Kent on several occasions). The inland pond habitats, which have apparently declined in Kent, are much less species-rich.

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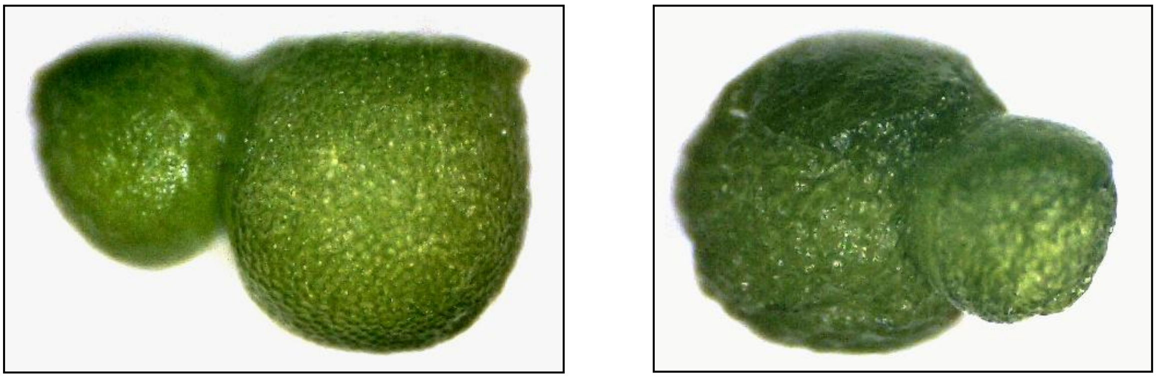
[969] Landolt E. (1994). Taxonomy and Ecology of the Section *Wolffia* of the Genus *Wolffia* (Lemnaceae). *Berichte des Geobotanischen Institutes der Eidgenössische Technische Hochschule, Stiftung Rübel, Zürich* **60**: 137–151.

[970] Mountford, J.O. (1994). *Wolffia arrhiza* (L.) Horkel ex Wimmer Rootless duckweed. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*. JNCC, Peterborough.



Wolffia from the Dowels. Photo by Lliam Rooney June 2012.

Flowering is such a rare event in Europe that reproduction and spread of *Wolffia* is vegetative, with young plants budding off. *Wolffia* may be carried to new localities by wildfowl, whether attached to feet or plumage, or passing through the gut. Some spread, especially for *W. columbiana*, may have been attributable to aquarists' trade.

Wolffia habitat at Fairfield. Photo by Geoffrey Kitchener, 4 August 2013

The following records were all made as *W. arrhiza* but require verification as not being *W. columbiana.* Records for 1971-80 from Philp (1982) are omitted, as these have been mapped earlier.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
West of Fordcombe	TQ54A		1991-99	EGP	TQ54A
Maytham	TQ82T		1991-99	EGP	TQ82T
South of Wittersham	TQ82X		1991-99	EGP	TQ82X
Small Hythe south	TQ8929		(1) 29 August 2014 (2) 15 August 2008 (3) 29 August 1970	(1) SB (2) BB (3) RMB	(1) In good quantity in a marsh dyke at TQ 8937 2972 with *Utricularia* sp., *Hydrocharis morsus-ranae* etc. (2) TQ 890 295, abundant. (3) TQ 894 296.
Rolvenden Layne	TQ8630		1 August 1995	KF	TQ 8658 3055, TQ 8684 3034, Friezingham Petty Sewer, Romney Marsh River Corridor Survey..
Ebony	TQ92E		1991-99	EGP	TQ92E
East Guldeford Level	TQ9523		19 July 2008	NS	(a) TQ 9578 2322 (b) TQ 9589 2370.
Appledore	TQ9529		7 August 2019	JP & FRG	
Fairfield	TQ92T, includes TQ9626, TQ9627	SSSI	(1) 4 August 2013 (2) 11 September 2008 (3) 2001 (4) 1991-99	(1) KBRG meeting (2) NS (3) BB (4) EGP	(1) TQ 96568 26862, in marsh dyke with Frogbit. (2) TQ 9652 2693, ditch FFD26 of Buglife grazing marsh survey; TQ 9634 2704, ditch FFD27 of survey. (3) TQ 9619 2699, abundant. (4) TQ92T.

Appledore east	TQ9629	SSSI	16 July 2015	KBRG meeting	Locally frequent in many ditches through the sheep pasture e.g. at TQ 964 298.
Brookland - Woolpack Bridge south	TQ9723		23 October 2019	SB	Very plentiful in a ditch at TQ 9793 2378, with *Lemna trisulca*, *L. minor, L. minuta* and *Sparganium erectum*. Possibility of *W. columbiana*, considered, but flat-topped nature of some plants may have pointed towards *W. arrhiza.*
South of Brookland	TQ9824	SSSI	29 August 2010	MG	TQ 98102 24037, abundant in ditch with *Sparganium erectum* and *Lemna minor*.
Brookland north - Misleham	TQ9926		17 Oct ober2014	JBr	With *Lemna trisulca* in a ditch at TQ 9992 2626.
Reading Street west	TQ9130		29 August 2019	SB	Extremely abundant in a roadside ditch at TQ 9195 3006.
Reading Street	TQ9230		29 August 2019	SB	In profusion in a roadside ditch at TQ 9212 3010. [***W. columbiana* was recorded, 2021, for TQ9230.]**
Red Hill, east of Reading Street	TQ9330		1982	JOM	TQ 938 302, Romney Marsh Ditch Plant Survey.
Appledore Heath east, the Dowels	TQ93Q, includes TQ9630, TQ9730, TQ9731	SSSI	(1) 16 October 2021 (2) 15 July 2019 (3) 12 July 2018 (4) 16 July 2015 (5) 30 September 2012 (6) 27 June 2012 (7) 12 September 2008 (8) 10 September2008 (9) August 2005 (10) 13 May 2004 (11) 9 August 2003	(1) SB (2)JP & Botany Group (3) DC (4) KBRG meeting (5) OL & BS (6) KBRG meeting (7) NS (8) NS (9) AF *et al.* (10) EGP (11) JP	(1) TQ 97843 31262, ditch on the Dowels sheep pasture, *W. arrhiza* thought at the time to have been present as well as *W. columbiana,* but this might not be so. (2) TQ9731 (3) TQ 97869 31281. (4) (a) In good quantity in ditch at TQ 9655 3002. (b) Frequent in ditch at TQ 9677 3036. (c) Ditch at TQ 9717 3030 and at TQ 9700 3039. (5) TQ 9781 3120, locally abundant. (6) TQ 97814 31205, still water of ditch with much emergent vegetation, amidst *Lemna minuta, Lemna trisulca* and *Hydrocharis morsus-ranae* (7) (a) TQ 9656 3002, ditch DWS31 Buglife grazing marsh ditch survey. (b) TQ9717 3032, ditch DWS34, Buglife survey (c) TQ 9731 3013, ditch DWS35, Buglife survey. (8) TQ 9778 3114, ditch DWS37, Buglife survey. (9) TQ9630, Back Drain, Biosurvey. (10) TQ93Q. (11) TQ9730. [***W. columbiana* was recorded, 2021, for TQ9731.]**
South of Warehorne	TQ93V		15 August 2000	EGP & PH	TQ93V.
Lydd Ranges - West Ripe)	TR0319	SSSI	7 August 2012	OL, GK, TI, SB.	Abundant in pond on acid ground at TR 03847 19887, with *Spirodela*.
Brenzett Green	TR0128		12 September2019	SB & OL	At the margin of a pond at TR 0105 2847. [***W. columbiana* was recorded, 2021, for TR0128.]**
Old Romney	TR02H		26 October 1995	EGP & DG	TR02H.
Lydd north east - Jack's Court	TR0521		2011	OL	TR0521.
Greatstone west	TR0722	SSSI	5 October 2019	OL	Abundant in an arable ditch adjacent to the shingle near to Greatstone Primary School, Greatstone TR 07654 22848.

					[***W. columbiana*** **was recorded, 2021, for TR0722.]**
South of Hamstreet	TR0131		24 August 2014	KFC meeting	In a dike on sheep pasture at TR 01563 31904, Bainbridge Farm with *Elodea nutallii, Stuckenia pectinata pectinatus, Lemna trisulca* and *L. minuta.*
South of Hamstreet	TR0132		24 August 2014	KFC meeting	In a dike on sheep pasture e.g.at TR 0164 3213, and probably elsewhere in the monad.
Ruckinge	TR0233		24 July 2008	Environment Agency	TR 02284 33243, Government Drain.
Newchurch west	TR0431		4 October 2019	SB & OL	In a ditch at TR 0433 3187, with *Hydrocharis morsus-ranae.* [***W. columbiana*** **was recorded, 2021, for TR0431.]**
West Hythe	TR1234		9 August 2003	JP	TR 121 341, masses in a recently cleared ditch on the north side of the Royal Military Canal.
South of Reculver	TR2268		(1) 22 September 2017 (2) 1 October 2013	(1) & (2) CO	(1) Still in original dyke but becoming full of vegetation and drying out in many places. (2) Dyke in Countryside Stewardship wet grazing meadow at c. TR 226 683; extensive where found.
Sarre	TR26M		1991-99	EGP	TR26M.
East Stourmouth	TR26R, includes TR2763		(1) 17 July 2019 (2) 1991-96	(1) GK (2) EGP	(1) TR 2764 6315, lake south of Stour, abundant, with *Spirodela*. (2) TR26R. [***W. columbiana*** **was recorded, 2021, for TR2763.]**
Ash Levels - Lower Goldstone north	TR2962		20 June 2014	SB	Marsh dyke on sheep-grazed pasture at TR 29388 62704 with *Lemna trisulca* and *Lemna minor*
Minster-in-Thanet	TR2964		2005	JBr	TR 29689 64044, TR 29973 64004, ditches in Lower Stour valley.
Sandwich, Royal St. George's	TR35P		1991-99	EGP	TR35P.
Ash Levels - Lower Goldstone north	TR3062		(1) 1 July 2016 (2)14 September 1997	(1) SB (2) NS	(1) a small amount hooked out of water at approx TR 300 625. (2) TR3062.
Ebbsfleet & Ash Levels	TR36G, includes TR3062, TR3063, 3162		(1) 1 July 2016 (2) 2005 (3)14 September 1997 (4) 1991-99	(1) SB (2) JBr (3) NS (4) EGP	(1) a small amount hooked out of water at c. TR 300 625 (2) TR 30292 63975, TR 31000 62376, ditches in Lower Stour valley. (2) TR3062, Ash Levels, north of Lower Goldstone. (3) TR36G

Zostera marina L. (Eelgrass)

Zostera noltei Hornem. (Dwarf Eelgrass)

vc 15 & 16

Rarity / scarcity status

Eelgrass and Dwarf Eelgrass (both also together with *Ruppia* spp. called Seagrass) grow scattered around the coasts of the British Isles between half- and low-tide marks, extending somewhat lower (to 4m depth below low tide) in the case of Eelgrass. Dwarf Eelgrass is more restricted in its distribution, being **nationally scarce.** Both species are perennials regarded as **Vulnerable** to the risk of extinction in England (also as regards Dwarf Eelgrass for Great Britain as a whole, although for Eelgrass, its GB status is **Near Threatened**). For Eelgrass, this English Vulnerable status arises because of a decline in its extent of occurrence and area of occupancy (51% and 57% respectively) in comparing English data over the periods 1930-1969 and 1987-1999. For Dwarf Eelgrass, the trend identified by such data is a 44% decline in the area of its occupancy. There is some evidence of fluctuations in Kent populations, but recording is probably incomplete; both species are **scarce** in the county.

Zostera marina is a Kent axiophyte and so is indicative of good habitat. Habitats of principal importance for the conservation of biodiversity in England under Section 41 of the Natural Environment and Rural Communities Act 2006 include 'Littoral Sediments: Seagrass Beds'. The former UK Biodiversity Action Plan carried priority habitat descriptions emphasising the value of seagrass beds, as the

> 'plants stabilise the substratum, are an important source of organic matter, and provide shelter and a surface for attachment by other species. Eelgrass is an important source of food for wildfowl, particularly brent goose and widgeon which feed on intertidal beds. Where this habitat is well developed the leaves of eelgrass plants may be colonised by diatoms and algae....stalked jellyfish and anemones. The soft sediment infauna may include amphipods, polychaete worms, bivalves and echinoderms. The shelter provided by seagrass beds makes them important nursery areas for flatfish and, in some areas, for cephalopods....Two species of pipefish.... are almost totally restricted to seagrass beds.'

Account

Eelgrass (distinct from *Zostera noltei*, Dwarf Eelgrass) was formerly divided into two species, *Zostera marina* and *Zostera angustifolia*, but the latter is now treated as a narrow-leaved form or variety of *Z. marina*, so the only *Zostera* species we are concerned with are *Z. marina* and *Z. noltei*.

The first Kent record for *Z. marina* is by Thomas Martyn in his *Plantae Cantabrigienses* (1763) which contains a list from Sheerness including *Zostera marina*, *Salicornia europaea* [this name was applied before a fuller understanding of the genus had been reached], *Atriplex portulacoides*, *Statice Limonium* [*Limonium vulgare*], *Inula crithmoides* [*Limbarda crithmoides*] and other saltmarsh species, together with various marine algae. A comparable list from the Sheppey north coast was sent by Daniel Cooper in July 1837 to the editor of *The Magazine of Natural History* which rather puzzlingly refers to *Zostera marina* growing in ditches, not a usual habitat.

Zostera marina, Cleve Marshes coastline. Photo by Lliam Rooney, 14 July 2010

Other early records are given by Hanbury & Marshall (1899), who regarded *Z. marina* in Kent as a rare plant of muddy coasts and were not convinced that *Z. noltei* was a Kentish plant beyond the county being a recipient of French or Belgian fragments washed up on shore. They referred to the presence of *Z. marina* on the Kent north coast at Harty Ferry (mainland), Faversham, between Seasalter and Whitstable, then east of Whitstable and at Reculver.

The extent of *Zostera* around the county's shores, however, appears to have been severely affected by the 'wasting disease' of the 1930s which decimated populations on both sides of the Atlantic. The extent of Kentish occurrence as the disease took its toll was investigated by Butcher (1934)[971]. He visited recorded sites at Faversham, Whitstable, Pegwell Bay and lagoons at Reculver in 1933 without being able to find any *Zostera* nor any local information except at Whitstable, where he was informed that the plant used to grow in a sea-bed depression known as Grassy Sand which had since filled in and the plant disappeared. Green *et al*. (2021)[972] have modelled data indicating that the UK has lost at least 44% of its seagrasses since 1936, 39% (34%?, the paper is not consistent) since the 1980s and perhaps as high as 92% over longer time spans. It is, however, apparent that Butcher was already encountering seagrass degradation in Kent before 1936, and Green *et al*. (2021) suggest that persistent gradual UK declines had been occurring centuries before Butcher's report, linked to environmental degradation through, e.g. coastal reclamation, industrialisation, oyster fisheries, bottom trawling; also, pollution by artificial fertilisers and herbicides may be implicated.

Zostera marina, Cleve Marshes coastline. Photo by Lliam Rooney, 14 July 2010

Francis Rose learned of probable *Z. marina* (the wide-leaved form)on mudflats near low water tide mark north west of Seasalter, reported to his correspondents in 1950 by local fishermen. The narrow-leaved form was then the norm and most of the 1950s/60s records communicated to him came from around Seasalter westwards to north of Castle Coote, except for a 1959 record from the north beach of Grain, the first record from West Kent. He noted the species, generally the narrow-leaved form, as one growing on mud flats below the general saltmarsh level, but far above low-water mark of ordinary tides (often over low water reefs); very rare, but locally abundant in at least three places. *Z. noltei* also received recognition for the first time in Kent, with Hector Wilks finding it on mud flats west of the Sportsman Inn, Seasalter, and near Castle Coote, a little further west.

Both eelgrasses, however, grew or came to grow more extensively than this, and the county surveys of 1971-80 (Philp, 1982) and 1991-2005 (Philp, 2010) provided good evidence. The 1971-80 survey found records of 'the narrow-leaved form of *Z. marina* in 14 tetrads ranging from north of St Mary Hoo to Swalecliffe (and up the Medway as far as Hoo St Werburgh), on mud flats along the Thames, Medway and Swale estuaries, and it was considered that the species was on the increase, a recovery from the dire situation of the 1930s. The same survey found *Z. noltei* to be rather local and rare, usually on slightly firmer mud, and present only in six tetrads at the Thames and Swale estuaries.

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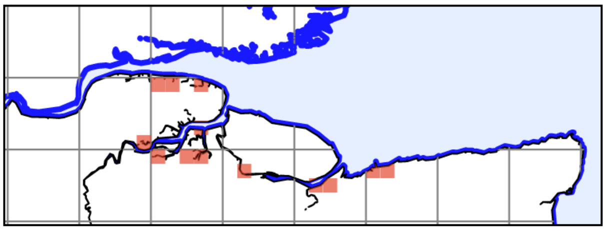
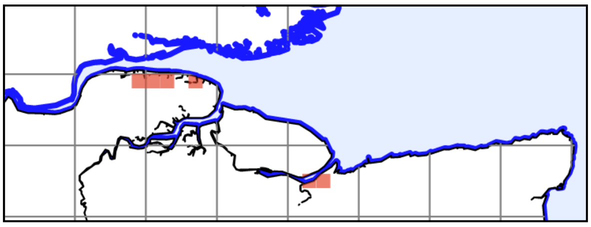
[971] Butcher, R.W. (1934). Zostera. Report on the Present Condition of Eel Grass on the Coasts of England, based on a Survey during August to October, 1933. *ICES Journal of Marine Science* **9**: 49-65.

[972] Green, A.E., Unsworth, R.K.F., Chadwick, M.A. & Jones, P.J.S. (2021. Historical Analysis Exposes Catastrophic Seagrass Loss for the United Kingdom. *Frontiers in Plant Science* **12**: 629962.

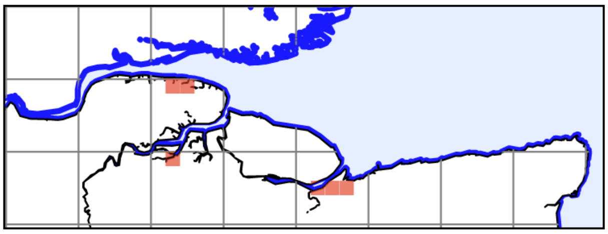


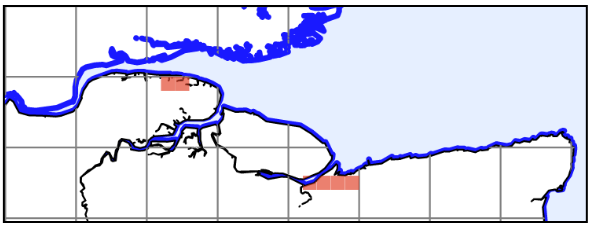


Zostera marina ***Zostera noltei***

Kent records 1970-86, displayed at tetrad level, from BSBI database. These consist only of 1971-80 survey records

The 1991-2005 survey found *Z. marina* in only seven tetrads, half the number from before, but it was considered as under-recorded in the Medway estuary through difficulty of access. The *Z. noltei* records, for five tetrads, were not dissimilar to the previous findings.

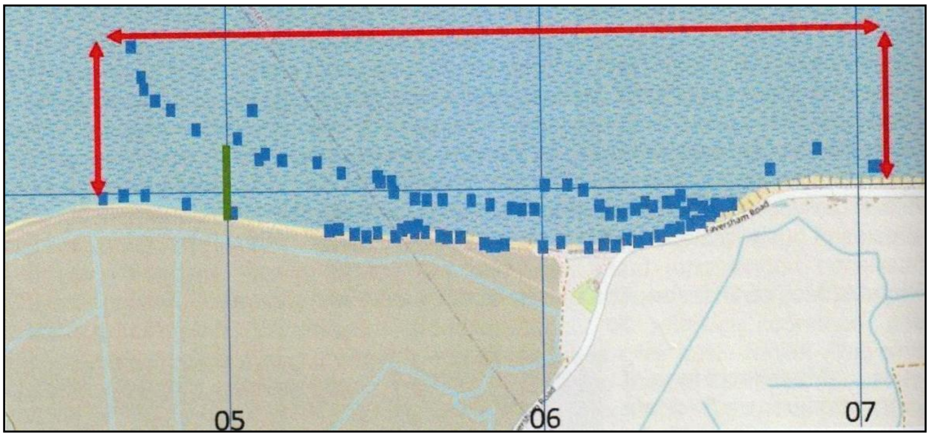




Zostera marina ***Zostera noltei***

Kent records 1987-2009, displayed at tetrad level, from BSBI database. These include 1991-2005 survey records plus an additional tetrad to the east.

Post-2010 recording, however, has been somewhat patchy. Limited records probably reflect a degree of oversight while botanists have focussed on upper shore and saltmarsh recording plus, perhaps, there is a degree of reluctance to venture far on tidal mud flats. There also remain difficulties of access to parts of the Medway estuary which Eric Philp had noted. Some of our records from the Medway estuary were made from a sailing boat at anchor, but represent floating fragments and so should not be regarded as the site of colonies. Not all records reached the BSBI database. There is no database facility for registering undifferentiated *Zostera* sp., and hence the database does not reflect survey data such as provided by a Kent Field Club meeting on 3 September 2022 (and a follow-up on 14 September), *vide* Tittley (2023).[973]



Zostera **Seasalter survey, September 2022, showing survey area bounded by red arrows, the observed extent of seagrass by blue squares and the transect study area by green line. The illustration is taken from Tittley (2023) with kind permission, the original being marked as Base Map © OpenStreetMap contributors.**

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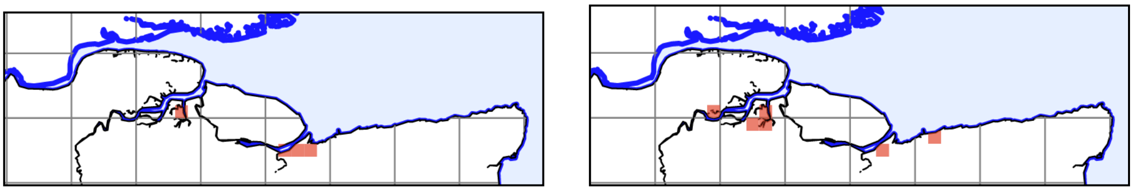
[973] Ian Tittley, under Reports of Field Club Meetings 2022 in *The Bulletin of the Kent Field Club* (2023) **66**: 30-31.

These surveys, although referring to undifferentiated *Zostera,* filled out our awareness of seagrass beds westwards from Seasalter, starting at TR 07070 65041 and continuing westwards for 2.5km to TR 04714 65357 (offshore) and TR 04620 64990 (inshore). Records were made in monads TR0464, TR0465, TR0564, TR0565, TR0664, TR0665, and TR0765. Plants began as very patchy, mostly on muddy sand, but westwards became more extensive, becoming a band 150m wide which narrowed, and then widened to over 350m. In large areas the plants formed 70-100% cover; occasionally they were found in seed. A transect from coast out to sea starting near the western end of the survey area began with patchy growth, but cover increased to 100% by 50m out and remained dense to 130m out, diminishing to small patches at 200m and only occasional plants from there until 280m out, beyond which presence ceased.

***Zostera* beds, Seasalter. Photo by Ian Tittley, 3 September 2022**

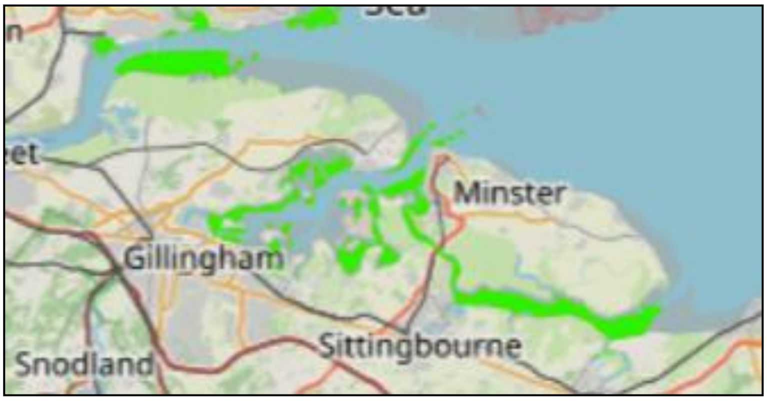
Subject to the limitations of recording, especially as regards differentiation between the species, but also as regards availability of records (e.g. of *Z. noltei* which are understood to have been made at Rushenden on Sheppey but not communicated to the BSBI database), Kent records for 2010-24 are given below.



Zostera marina ***Zostera noltei***

Kent records 2010-2024, displayed at tetrad level, from BSBI database

The biodiversity value of the habitat has led to consideration of the possibility of habitat creation or restoration, which may also carry advantages of carbon sequestration, fisheries support and protection through sediment stabilisation from coastal erosion. This has resulted in the identification of areas with potential for such treatment.[974] These are much wider than the extent of known colonies, having been identified on the basis of environmental variables such as water speed, wave energy, turbidity and salinity.



Kent areas with potential for seagrass bed restoration or creation, shown coloured green, from Environment Agency https://www.data.gov.uk

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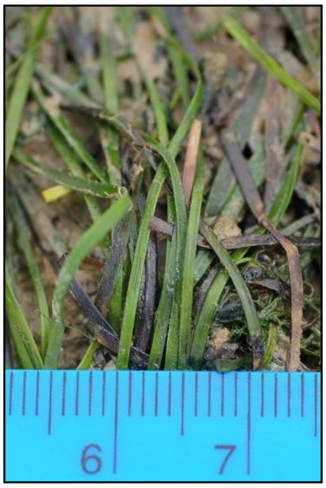
[974] Habitat restoration issues are considered *in Seagrass Restoration Handbook UK & Ireland* (November 2021), edS. Gamble, C. et al., https://researchportal.port.ac.uk/en/publications/seagrass-restoration-handbook-uk-and-ireland

Z. marina[975] grows mostly on firm muddy sand, sometimes covered with a coarser layer, but its substrate may range from soft mud to sandy gravel. Light availability probably limits its growth in deep water, although it may grow at a depth of 10 (-15)m in clear waters, while the degree of drying out may limit its growth above low water tide level. Flowering begins when the sea temperature reaches 15°C and pollination is effected by water movement. It reproduces by seed, which is heavier than water, and is dispersed by tides, with germination probably occurring in autumn and early winter. Fish are also said to be capable of facilitating dispersal and, as for birds, Francis Rose received a communication as regards a Mallard shot off Milfordhope saltings in the Medway estuary in September 1958 which had 170 seeds of this species in its food tract, in perfect preservation, having probably fed just prior to being shot[976]. The plant's principal manner of spread, however, is by rhizomes breaking off and being carried away by tides so as to root elsewhere in suitable habitats.

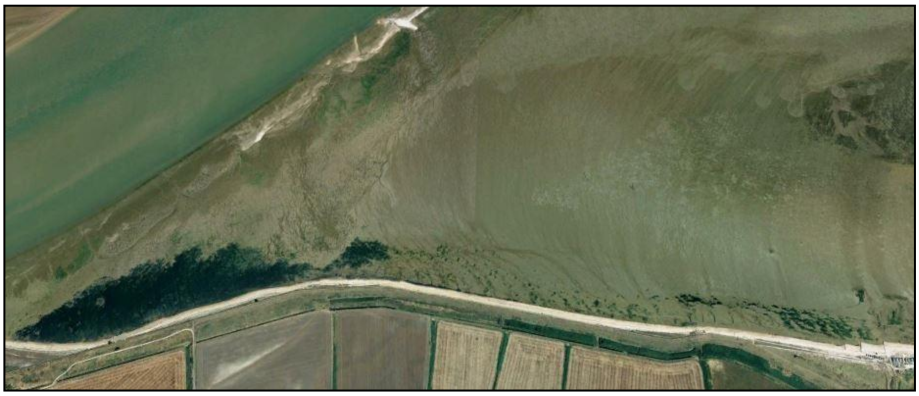
The ecology of *Z. noltei*[977] appears broadly similar to that of Z. *marina*, and the two species may grow in proximity, but *Z. noltei* will normally grow higher up the shore, generally in the intertidal zone and even adjacent to the lower saltmarsh, and so is capable of withstanding more prolonged exposure to light and air.



Zostera noltei Cleve Marshes coastline. Photo by Lliam Rooney, 17 July 2010

The two species are differentiated by the leaves of *Z. noltei* being less than 1mm wide; those of *Z. marina* are (1)2-10(12) mm wide. The maximum length of the leaves also differs: up to 22cm (*noltei*) v. up to 50(120) cm (*marina*). Flowering stems of *Z. marina* are much branched; not so with *Z. noltei*.

Cleve Marshes coastline, showing exposed mud flats across the range over which *Zostera marina* was recorded in July 2010. Image date September 2009, Google earth, Getmapping plc, Landsat/Copernicus.



In the *Dictionary of the Kentish Dialect* (W. D. Parish and W.F. Shaw, 1888), there is an entry for 'waur' or 'waure' ('Sea-wrack; a marine plant (*Zostera marina*), much used for manure'). It is, however, probable that the term was of more general application to marine algae as well, and *The Dialect of Kent* (F.W.T. Sanders, c.1950) equates it with seaweed as 'An almost extinct dialect word used by the old-time sea-weed gatherers who sold this produce of the sea to use upon the land as fertiliser. Margate, Ramsgate and Kingsgate were the seaside resorts where this word was mostly used'. Those locations are not *Zostera* sites (although an old record is claimed for Pegwell Bay).

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[975] Much of the information in this paragraph derives from Tutin, T.G. (1942). Zostera L. *Journal of Ecology* **30**: 217-226.

[976] Ability to germinate after passage through the gut of birds and fish was demonstrated by. Sumoski, S.E. & Orth, R.J. (2012). Biotic dispersal in eelgrass *Zostera marina. Marine Ecology Progress Series* **471**: 1–10

[977] Cf. Scott, M. (1994). *Zostera noltii* Hornem. Dwarf Eelgrass. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*. JNCC, Peterborough.

The following records omit those for 1971-80 from Philp (1982) and Philp (2010) as these have been mapped earlier and carried no details other than tetrad presence.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Zostera marina					
Burntwick Island south - Sharfleet Creek	TQ8671		25 September 2018	CC	A single piece floating (i.e. not growing) in Sharfleet Creek, TQ 8653 7146, observed from sailing boat at anchor.
Motney Hill	TQ86J		9 August 1995	KFC meeting	Growing strongly in a mud pool within the saltmarsh. [Grid reference not assigned, but TQ86J corresponds with a 1991-94 EGP record in Philp (2010).]
Stangate Creek	TQ8770		4 September 2023	CC	Recorder while sailing encountered some loose *Zostera* leaves on his anchor warp in Stangate Creek, c. 30cm long with a distinct central and 2-3 lateral veins each side*; Z marina* (*angustifolia* variant).
Grain beach	TQ8877		21 October 2007	IF	TQ 889 771.
Nagden Marshes - South Bank of Swale NR	TR0364	SSSI, local nature reserve	(1) 15 September 2021 (2) 11 September 2020 (2) 14 July 2010	(1)& (2) KBRG meeting (3) LR	(1) & (2) TR0364. (3) Roughly from TR 039 647 to TR 055 648 (i.e. including TR0364). It quite possibly went as far out as -650 but very hard to say for sure (not an easy plant to record and quite dangerous as the tide comes in very fast!).
Cleve Marshes west	TR0464	SSSI, local nature reserve	1) 11 September 2020 (2) 14 July 2010	(1) KBRG meeting (2) LR	(1) TR0464. (32 Roughly from TR 039 647 to TR 055 648 (i.e. including TR0464).
Cleve Marshes east	TR0564	SSSI, local nature reserve	(1) 15 September 2021 (2) 14 July 2010 (3) 12 July 2010	(1) KBRG meeting (2) LR (3) GK	(1) TR 054 648. (2) Roughly from TR 039 647 to TR 055 648 (i.e. including TR0564). (3) TR0564, tidal mud.
Graveney	TR0664	SSSI	22 October 2022	CO	TR0664
Seasalter	TR0765	SSSI	1 November 1987	EGP	TR 078 651.
Seasalter	TR0865	SSSI	19 December 2004	DM	TR 0807 6555.
Whitstable	TR0965		22 July 1995	AWi	TR 097 657, Whitstable Bay opposite Sherrins Alley.
Zostera noltei					
Hoo St Werburgh south	TQ7871	SSSI	20 October 2023	MGr	TQ 78976 71166, recorded as 51.41127 lat 0.572167 long with 1000m accuracy, many large patches found on mud walking at low tide, SeagrassSpotter website.
Upchurch - Millfordhope Saltings	TQ8569	SSSI	20 October 2023	MGr	TQ 85238 69600, recorded as 51.395188 lat. 0.661283 long. to 1000m accuracy, many small patches on mud walking at low tide, SeagrassSpotter website.
Burntwick Island south - Sharfleet Creek	TQ8671	SSSI	25 September 2018	CC	A number of pieces floating (i.e. not growing) in Sharfleet Creek, TQ8653 7146, observed from sailing boat at anchor, also fragments cast up on shore. Possibly washed in from further west, Half Acre Creek / Bishop Ooze.
Barksore Marshes	TQ8769		25 September 2018	CC	TQ 8751 6977, floating fragments observed from sailing boat at anchor off Slaughterhouse Point.
Grain beach	TQ8877	SSSI	26 June 2005	DM, BC, IT	TQ 8891 7719 and TQ 8883 7711, Shoresearch.
Rushenden	TQ 9071	SSSI	(1) 15 March 2008	(1) DM	(1) TQ 9026 7140, Shoresearch.

Sheppey			(2) 14 March 2008	(2) BC, FB	(2) TQ 9040 7157.
Cleve Marshes west	TR0464	SSSI, local nature reserve	(1) 20 October 2023 (2) 15 September 2021 (3) 11 September 2020	(1) MGr (2)& (3) KBRG meeting	(1) TR 04529 64968, recorded as 51.346978 lat. 0.935548 with 1000m accuracy, large area of continuous seagrass over 50 sq m, with flowers and seeds, found on muddy sand walking at low tide. Length 10-20cm. SeagrassSpotter website (2) Specimen collected from mud at *c*. TR 0424 6490. (3) Close to the shore line with *Z. marina* (TR 04536 64971).
Cleve Marshes east	TR0564	SSSI, local nature reserve	12 August 2010	GK & LR	On mud flats near shore, firmer parts, 1.3mm wide leaves, sheaths not fused into tube.
Seasalter	TR0765	SSSI	1 November 1987	EGP	TR 076 651.
Seasalter	TR0865	SSSI	9 July 1988	ANG	TR0865.
Tankerton - Swalecliffe	TR1367	SSSI	3 August 2013	BW	TR1367.

Kent Rare Plant Register Appendix A

Accounts of plants which were once on the register, but which have been removed

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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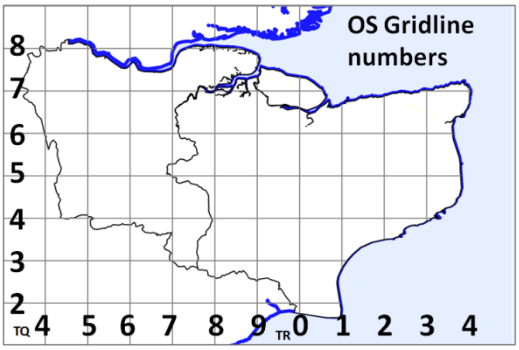
These accounts relate to plants which at some stage have been withdrawn from the rare plant register. They are preserved so that the work of their production is not wasted. In any event, many of the plants are of considerable interest, of conservation value and may be indicators of good habitat. So they should not be regarded as inferior, just because they no longer fit the criteria for inclusion in the register.

Access. Please note that the records include sites which are on private land and access may not be available without landowners' permission.

Extent of records. These accounts give priority to data from 2010 onwards and data tables generally do not cover records before 1970. The text of the accounts, however, mentions some earlier records so as to describe first discovery and subsequent trends.

Mapping. Distribution maps generally show the boundary between East and West Kent (vice counties 15 and 16) as a black line. The records derive from a number of sources and not all of them form part of the BSBI's database. Accordingly, the text of accounts may refer to a site which is not reflected in distribution maps taken from that database. Maps may be given at tetrad (2 x 2km squares) or monad (1 x 1km squares) levels. Tetrads display more clearly, but the aim of this register is to identity records at high resolution, so that where they are not given in the text, including the data tables, then the register will generally define presence on monad level maps. BSBI database-derived maps lack numbering of Ordnance Survey gridlines: these are given here:



The full Kent rare plant register can be found via the Kent webpage of the BSBI website at https://bsbi.org/kent and includes:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- Appendix A (plants which were on the register but have been removed); Appendix B (the 'probably extinct' rare plant list); and Appendix C (how the register was put together).

Abbreviations used in the accounts:

Recorders' initials:

AL Alex Lockton
AWi Tony Witts
BW Brian Woodhams
CB Caroline Bateman
CC Chris Cook
CO Colin Osborne
CR Chris Rose
DR David Roche
DCh Danny Chesterman
DG Doug Grant
DM Daphne Mills
DS David Steere
DT Dan Tuson
EGP Eric Philp
EW Elizabeth Winterbourne
FR Francis Rose
GJ Geoff Joyce
GK Geoffrey Kitchener
HS Heather Silk
IS Ian.Sapsford
JA Jan Armishaw
JB John Badmin
JC Juliet Cairns
JM Joumana Mobarak
JoG José Gibbs
JP Joyce Pitt
JW Jo Weightman
KBRG Kent Botanical Recording Group
LH Lorna Holland
LM Lesley Mason
LNHS London Natural History Society
LR Lliam Rooney
MR Mike Robinson
NB Nick Bertrand
PA Pete Ackers
PB P. Buckley
PHe Peter Heathcote
RG Bob Gomes
RMB Rodney Burton
RR Rosemary Roberts
SL Stephen Lemon
SLP Sharon Pilkington
SB Sue Buckingham
SK Sarah Kitchener
SM Steve McArragher
SP Sue Poyser
TI Tim Inskipp
VAJ V.A. Johnstone

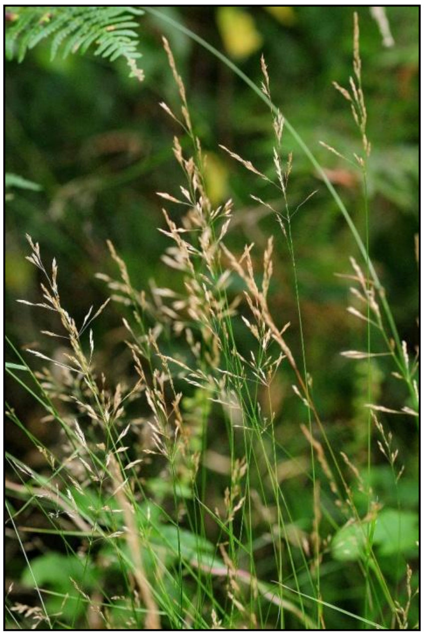
Other abbreviations and references:

BSBI = Botanical Society of Britain & Ireland	Philp (1982) refers to Atlas of the Kent Flora (1982) by E.G.Philp	
Hanbury & Marshall (1899) refers to their *Flora of Kent*	Philp (2010) refers to A New Atlas of the Kent Flora (2010) by E.G.Philp	

Agrostis vinealis Schreb. (Brown Bent)

Agrostis vinealis was on the rare plant register 2011-23. It was removed because, although originally supposed to be locally scarce, subsequent recording showed that it was fairly frequent on infertile acid soils. This account is the March 2022 version and has not been updated since.

vc 15 and 16

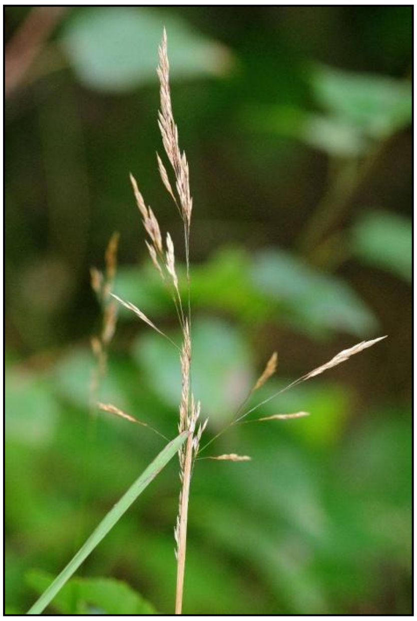


Rarity / scarcity status

The prospect of any threat to *Agrostis vinealis* in England and in Great Britain as a whole is considered to be of 'Least Concern'. In Kent, the relatively few recorded occurrences of this species have led it to be treated as locally **scarce**, although this understates its frequency and an increased focus on recording has resulted in a position where it is unlikely that this species will be sustained in this register.

Account

This grass favours dry acidic grassland or heath, on well-drained sandy or peaty ground, and occupies much the same habitat as *Agrostis capillaris* (Common Bent). It closely resembles *Agrostis canina* (Velvet Bent) and, indeed, was long treated as falling within that species, whether as a variety or subspecies.



Mereworth Woods. Photos by Lliam Rooney, 4 September 2014

The standard work on grasses in the British Isles (Hubbard, 3rd edition) lumped the two taxa together as subspecies and was not replaced until 2009, when *Grasses of the British Isles* (Cope & Gray) was published, treating the taxa as separate species. Specific treatment had been adopted by standard floras earlier, but not in time for Philp (1982) to provide separate maps for the two taxa, which were treated together as *A. canina*[978]. It is therefore difficult to establish the historic position regarding occurrence of *A. vinealis* within the county and also, because it is not easy to identify this grass, the current position. Philp (2010) gave only five tetrads (Sundridge, Dartford Heath, Stansted, Orlestone Forest), but in stating that these were all that were presently recorded, there is perhaps an implication that more could be recorded in future. That is certainly the case and there appears to have been an issue of recognition here, with 15 tetrad records (equivalent to 17 monads) made 2010-19, and 27 (equivalent to 36 monads) for 2020-21.

The habitat preferences of *A. vinealis* and *A. canina* are distinct, the latter preferring wetter terrain. Given the degree of coincidence of the habitat preferences of *A. vinealis* and the widespread *A. capillaris*, there ought to be opportunities for Brown Bent to flourish, but this is not apparent from the relatively few Kentish records.

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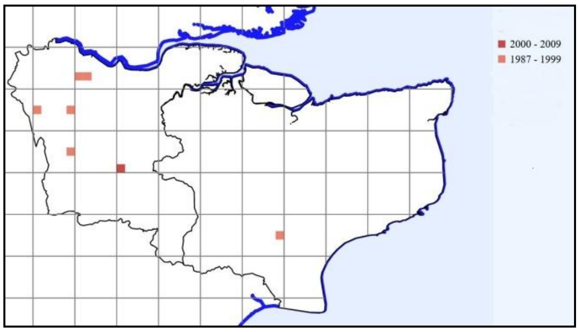
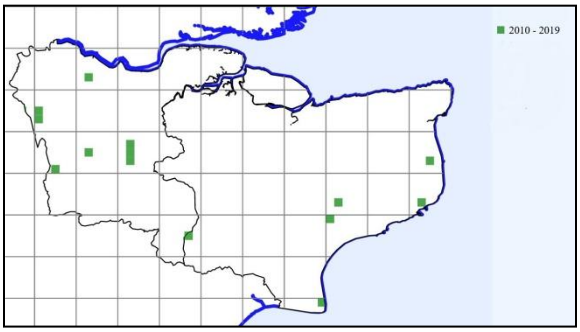
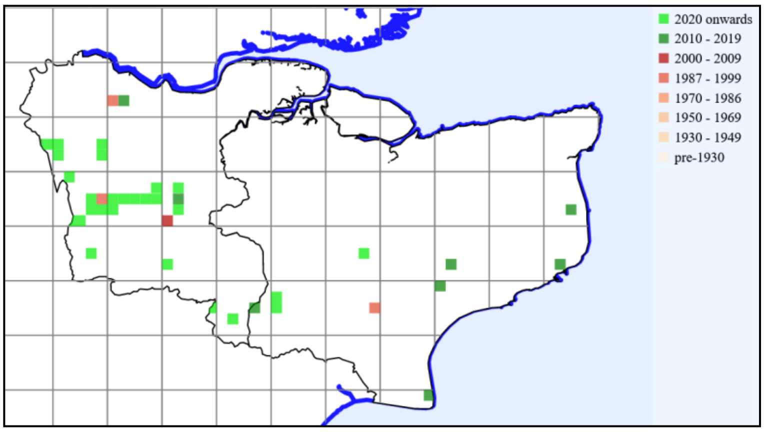
[978] Noted, however (as *Agrostis canina* var. *montana*), on a dry bank under old hornbeam coppice in the course of a KFC meeting in 1973 (*Kent Field Club Bulletin* (1974) **19**:21).

Those records suggest that Brown Bent occurrences are more focussed on leached, highly infertile acid soils. In West Kent, these soils are often used for forestry, as unsuitable for other cultivation; and the grass may be found on rides and banks of plantations on the sandy chartlands north of the Greensand Ridge, and on the Tunbridge Wells Sand Formation, e.g. at Bedgebury. It is also recorded on the acid gravelly commons of north west metropolitan Kent, e.g. West Wickham, Hayes and Keston Commons (all on the Harwich Formation), and at Dartford Heath (on sands of the Thanet Formation).



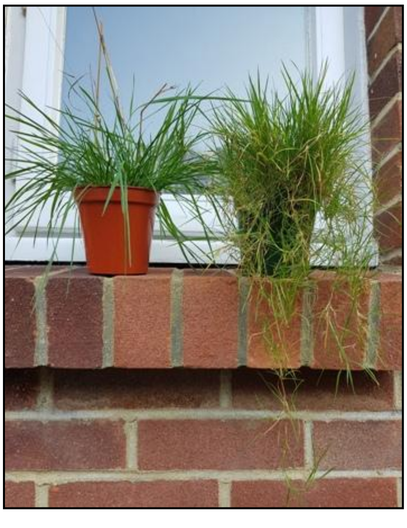


The accompanying distribution maps demonstrate the effect of increased recognition of the species in the course of recording: 1987-2009 (top left); 2010-19 (top right); and cumulative to 2021 (bottom right).



Habitat, Dibden Lane, Sevenoaks. Photo by Sarah Kitchener, 5 November 2020

In identifying *A. vinealis*, one can separate it from *A. capillaris* by virtue of the latter having a large palea, at least half the length of the lemma (not visible, or up to one fifth the length of the lemma in *A. vinealis*) and a blunt ligule of the uppermost leaf on a flowering stem (acute in *A. vinealis*). The principal factors in separating *A. vinealis* from A. *canina* are habitat and the latter's surface-creeping runners with their tufts of fine shoots at the nodes, often forming loose mats (*A. vinealis* is tufted, without stolons). The spikelets clump together, whereas those of *A. capillaris* and their branchlets are more open and delicate in appearance. Those of *A. gigantea* (Black Bent) also clump together but with their branchlets appear stouter, and more rigidly divaricate.



Comparison of *A. vinealis* (left, compact tufted habit, no stolons) with *A. canina* (lax habit with spreading stolons). Photo by Sue Buckingham, November 2020

Dipsacus pilosus L. (Small Teasel)

Dipsacus pilosus was on the rare plant register 2011-23. It was removed because, although originally supposed to be locally scarce, subsequent recording showed that it was fairly frequent in woodland and stream- or river-sides. It is a Kent axiophyte and so is a worthy species indicative of good habitat. This account is the March 2022 version and has not been updated since.

vc 15 and 16

Rarity / scarcity status

Small Teasel is widely scattered but local in England and the Welsh Borders, and its conservation status is one of 'Least Concern' both in England and in Great Britain as a whole. In Kent, however, there are relatively few localities, and it has been ranked as **scarce** on the basis of data in Philp (2010), although subsequent records show that, strictly speaking, it appears more frequent (three times as much as previously supposed) and may not warrant rare plant register status going forward.

Account

The first published county record for *Dipsacus pilosus* was made by Matthias de L'Obel in 1570, in his *Stirpium Adversaria Nova*, as found in Kent near highways and suburbs of Sandwich; Hanbury and Marshall (1899) interpreted this as probably intending Richborough. In Hanbury and Marshall's time, the species was regarded as frequent but decidedly local, in shady or damp thickets and hedges. Some of the localities cited still hold this species. J. Groves contributed to Hanbury and Marshall (1899) a record of Small Teasel at Lullingstone: it is still seen from time to time near the lake by Lullingstone Castle. De Crespigny in his *New London Flora* (1877) referred to it "in a shady lane leading from Wrotham to Cuxton, about 1½ miles E. of Wrotham": this is evidently Pilgrim's Way below Trosley Country Park, where the species still persists in shade above the road.

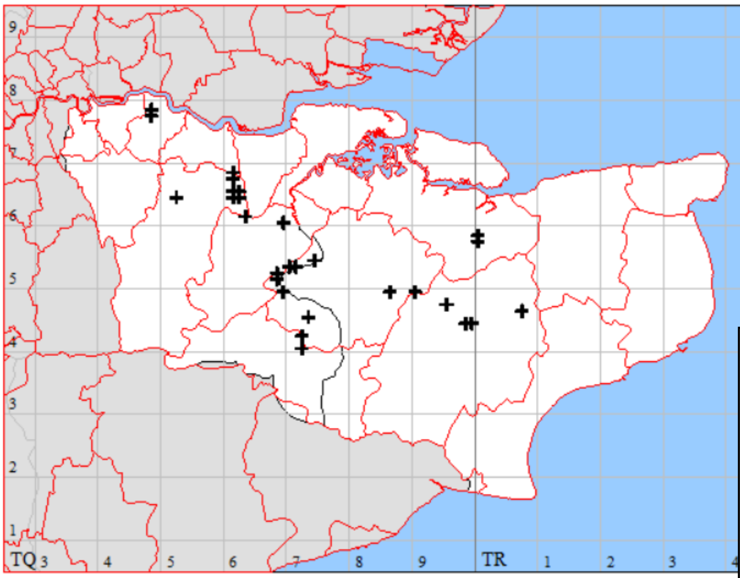
Trosley Country Park. Common and Small Teasels growing together. Photo by Lorna Holland, 19 August 2011

Philp (2010) treated it as always having been a very local species in Kent, giving eight tetrad records. In numerical terms, this suggests a fairly constant presence from the nine tetrad records given in Philp (1982). However, only two of these tetrads are the same in both surveys. It is accordingly difficult to interpret the data as supporting a description of the plant as local in a sense of persisting as populations in very limited geographical areas, unless many of the earlier survey finds are still present. However, as Small Teasel is a biennial needing disturbance for germination, it is possible that a lack of woodland management may account for some disappearances, until conditions provide an opportunity for any residual seed-bank to restore the plant's presence.

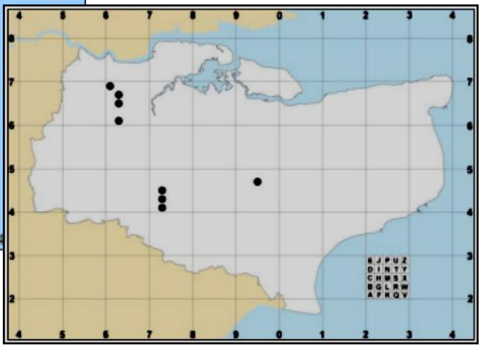
Teston Bridge. Photo by Lorna Holland, 10 August 2011

Dipsacus pilosus is a plant which in Kent has been recorded at woodland edges and in rides, particularly (but not exclusively) in damp conditions, on stream-banks and river-margins (the Beult, Darent, Medway and Teise) and in wet marshy land. There are probably more plants at Hartley Wood than all the other populations put together.

Habitat, Yalding. Photo by David Steere, 11 August 2019



Dipsacus pilosus (Small Teasel) 2010-20



Dipsacus pilosus (Small Teasel) 1991-2005

Whilst recording data are being maintained in tabular format, the 2010-21 distribution is also given here as a map, showing 28 monads (representing 24 tetrad records), and so well exceeding the eight tetrads given in Philp (2010), in most of which the species has been re-found.

The 1991-2005 comparison distribution map is given by kind permission of the late Eric Philp and the Kent Field Club.

Site	Grid reference	Site status	Last record date	Recorder	Comments
West Heath (metropolitan vc16)	TQ4877		13 July 2020	MR	TQ 48148 77298, three plants in garden, not noted in previous years and origin unknown.
Lesnes Abbey Woods (metropolitan vc16)	TQ4878		(1) 4 July 2018 (2) 24 June 2012	(1) RMB (2) CR	(1) TQ 4818 7882. (2) TQ 48198 78803. Several near northern edge of wood, up path south of children's play area. Strimmed off by Council

					contractors, despite Council officers being told the plants were here. Some re-growth evident.
Lullingstone	TQ5264		(1) 14 September 2014 (2) 18 September 2011	(1) & (2) RMB	(1) Reduced in area by partial clearance but still in reasonable numbers. Best viewing point from path is now near to anglers' car park. (2) A dense colony between the River Darent and Lullingstone Lake, known to RMB here since 1989, inaccessible but visible from across the river with binoculars - identity confirmed in 1991 when there was an outlying plant by the river at TQ 52848 64322. Known at Lullingstone since before 1899.
North of Ridley	TQ6164		(1) 17 April 2018 (2) 12 October 2015 (3) 24 July 2014	(1) GK & SK (2) & (3) CC	(1) TQ 6135 6418, north end of Ridley Wood alongside footpath, numerous rosettes in two main groups. (2) Same site as 2014, but few plants, perhaps due to very tall stinging nettles. (3) Hartley Bottom Road through field gate to a clump about 10 x 10 metres on the left, TQ 6139 6498, growing to 2 - 2.4 metres high.
Hartley	TQ6167, TQ6168		(1) 4 August 2021 (2) 7 July 2020 (3) 25 April 2017 (4) 12 October 2015 (5) 16 August 2014 (6) 1 May 2014 (7) 25 August 2010	(1) DS (2) PHe (3) DS (4) CC (5) DS (6) JP (7) RR	(1) Only a handful of plants (now flowering) seen as a path exits the wood around about TQ 6175 6805, growing with *Cichorium intybus*, *Urtica dioica* and *Calystegia sepium*. Thousands in flower in the next monad south, though. (2) TQ 61753 67975, colony has expanded enormously over last 4 or 5 years and now occupies at least 1000 sq m, with density of at least 40 plants per sq.m., total estimate 40-50,000 plants. (3) TQ 61794 67839, Hundreds of plants on eastern edge of and well into Hartley Woods, South of previously recorded colony. (4) TQ 6175 6507 to TQ 6195 6523, dominant species along west edge of Grubb's Wood, with scattered plants to the north and south and in wood. (5) Inside Hartley Wood, TQ 617 679, a population of c.200 plants with flower heads but not yet flowering. About 20 yards or so away outside the wood but on the shaded eastern edge (facing east) was another population of c.500 plants, with some in flower, TQ 618 679. (6) Thousands of plants along eastern edge of Hartley Wood to old tip, in both TQ6167 and 6168. (7) TQ 617 678, woodland edge, Hartley Wood. Patch just inside the wood estimated to cover an area of about 120 sq metres whilst a patch on the field side of the wood covered about 250 sq

					metres.
Hartley	TQ66E		After 1990, before 2006	EGP (Philp, 2010)	This may the same as TQ6168 above.
Meopham	TQ6265		4 October 2016	JP	Elbows Wood
Trottiscliffe	TQ6361	Country Park managed by Kent County Council	(1) 29 June 2018 (2) 19 August 2011 (3) 13 August 2010 (4) After 1990, before 2006	(1) KBRG meeting (2) LH (3) SB (4) Philp (2010)	(1) Trosley Country Park, In the usual place and very plentiful due to recent scrub clearance around TQ639 610. (2) Present at TQ 63316 61053 – upper path. (3) TQ63914 61085, Abundant plants in woodland on chalk, recent clearance providing extended habitat for future. (4) Given as TQ66F. [There is a long history of records for this area.]
Nettlestead	TQ6851		198 August 2018	GK & SK	(a) TQ 68762 51700, in shaded area for 6ft along w bank of R. Medway. (b) TQ 68719 51497, in the open in coarse vegetation, for some 6ft along the w bank of the R. Medway, plus outlier plant at TQ 68725 51510. (c) TQ 68701 51461, in coarse vegetation in the open for some 15ft along the w bank of Medway.
Nettlestead	TQ6852		(1) 18 August 2018 (2) 16 February 2013	(1) GK & SK (2) GK & SK	(1) TQ6 8671 52156, in coarse vegetation for 8m along w bank of R. Medway. (2) Three plants at TQ 68705 52295 and another a few metres away. In tree-shaded area by path on west bank of Medway.
Yalding	TQ6949		11 August 2019	DS	One large flowering plant at TQ 6995 4976 on banks of River Beult (vc16 side). Surrounded by *Impatiens glandulifera*.
Leybourne	TQ6960		5 August 2016	GK	TQ 6917 6004, c.20 plants in rough vegetation north of access bounding lake.
Meopham	TQ66H		(1) 7 May 1995 (2) After 1990, before 2006	(1) JP (2) EGP (Philp, 2010)	(1) TQ 628 653. (2) Elbows Wood.
Meopham	TQ66I		After 1990, before 2006	EGP (Philp, 2010)	Orange Hill.
Winchet Hill	TQ74F		After 1990, before 2006	EGP (Philp, 2010)	
Marden Beech	TQ74G		After 1990, before 2006	EGP (Philp, 2010)	
Great Pattenden	TQ74H		(1) 19 August 2017 (2) 28 August 2014 (3) After 1990, before 2006	(1) BW (2) SM (3) EGP (Philp, 2010)	(1) TQ7345 (2) Large patch of flowering plants at TQ 737 456 near Teise bridge and next to road. FR also recorded it in 1958 on the bank of the Teise at Marden Mill, north west of Marden, probably at TQ7345.
Teston	TQ7053		(1) 4 November 2020 (2) 10 August 2016 (2) 4 August 2012 (3) 10 August 2011 (4) 3 August 2010	(1) CB (2) BW (2)JB (3) & (4) LH	(1) TQ 70835 53093, between the footpath and the fishpass north of the lock. (2) Recorded as TQ7053. (2) TQ708531, Teston lock, R. Medway. (3) TQ70875 553242, still at lock, but now by Teston Bridge and another site by river. (4) TQ70840 53059, in excess of 20 plants spreading for previous three

					years, by Teston Lock.
Teston	TQ7153		10 April 2010	LH	TQ718531, by weir, Teston car park, in seed, also seed heads further along site, det. EGP 2009.
East of Horsmonden	TQ7240		26 November 2013	LM	TQ 72394 40684, by the old Teise channel of the River Teise near Harper's weir, Harper's Farm.
Marden Beech	TQ7242		21 August 2016	GK & SK	(a) TQ 72422 42595, seven plants at wood margin bounding former channel of R. Teise. (b) TQ 72522 42945, at least 11 plants on banks of the Lesser Teise, in coarse vegetation or below willows.
North west of Marden	TQ7345		8 August 2016	SB	A massive population of plants on the bank of a drain of the Lesser Teise at TQ 7341 4567; also more plants at result of stream-side vegetation clearance under a power line at TQ 7381 4595, all on Mill Farm.
Tovil	TQ7454		21 April 2018	SL, BW	Bydews Wood, Tovil. Western edge on shady path at edge of River Medway. Large broken patch of plants at edge of path and very edge of river (TQ 74550 54212). Oval basal leaves only showing.
Grafty Green	TQ8649		(1) 16 October 2014 (2) 18 December 2012	(1) GK & SK (2) SB	(1) TQ 8658 4915, 70 stems counted, plus one by footpath 30m further west. In wet woodland below steep ground, presumably outcropping Hythe Beds, mostly below *Alnus glutinosa* and *Corylus avellana.* (2) At least 50 plants within 10 metres alongside a public footpath through a small marshy copse at TQ 86590 49157, growing with *Carex pendula* and under *Alnus glutinosa.*
Little Chart / Charing	TQ94N		(1) 22 October 2012 (2) 9 August 2006	(1) SB (2) EGP	(1) Four plants in seed at TQ 95412 47979 on a stream bank where the stream meets both Newcourt Wood and a line of planted *Alnus cordata.*
Godinton	TQ9888		27 August 2014	GK	TQ9 899 4440, five plants along 10 metres of the west side of Godinton Lane through woodland, shaded.
Badgin Wood, Sheldwich	TR0057, TR0058		20 June 2018	LM, DCh	(a) Many scattered plants along the extreme margin of the northern edge of Badgin Wood, (T R003 579). First recorded from the area in 1777 and last recorded here in 1856. (b) A patch of 50+ plants in the extreme margin of the east side of Badgin Wood, (TR 00320 58047).
Wye Crown	TR0746		3 December 2020	DT	A few large stands at TR 0769 4643 in Colyherhill Wood, private woodland on an east-facing slope under ash, maple, hazel and spindle with ground flora of wild garlic etc. Recorder told by keeper of other populations in same wood where rides and glades had been opened up and created over recent years.

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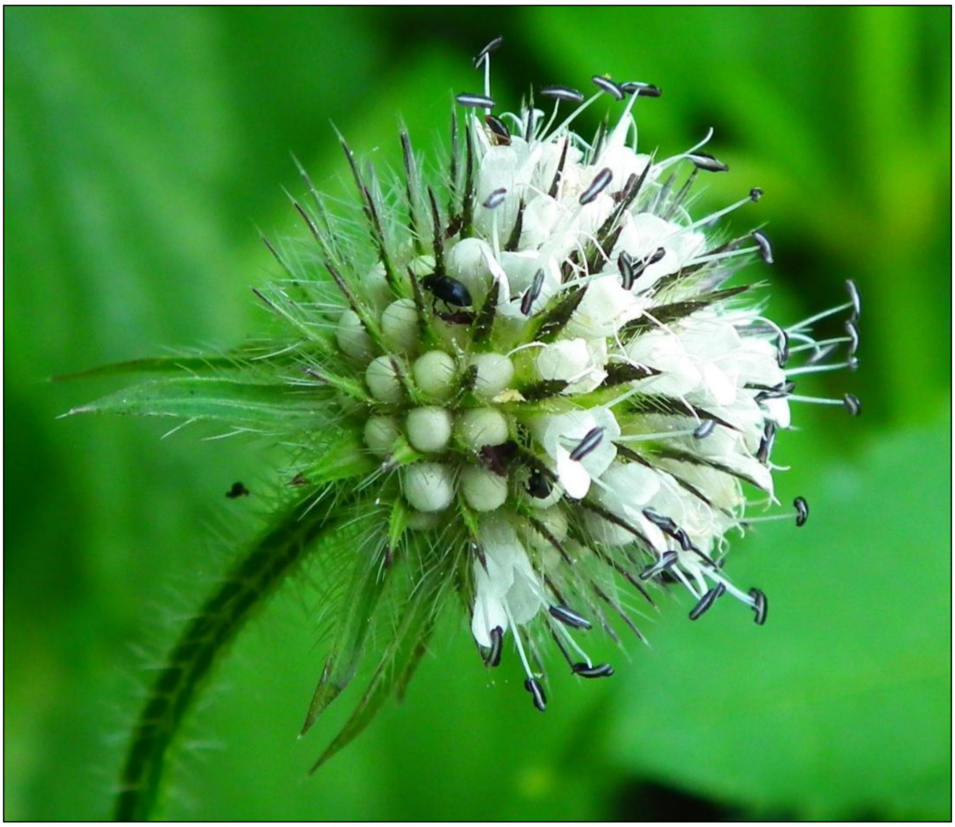


Hartley Wood. Photo by David Steere, 16 July 2014

Epilobium roseum Schreb. (Pale Willowherb)

Epilobium roseum was on the rare plant register 2010-12. It was removed because, although initially considered to be locally scarce, subsequent recording showed that it was widespread, although infrequent. Only three Kentish tetrad records were published in Philp (2010), exhibiting a dramatic decline from the 54 records given in Philp (1982). It appears that this decline has been over-estimated, and the records added in 2011 were sufficient for the species to be removed from the register. Most of these additional records were in urban habitats, particularly at pavement edges and the junction of pavements and walls where there is water run-off. These habitats are susceptible to local authority street-cleaning and weedkiller application, but the species seems fairly resilient. It is possible to recognise the species in leaf, due to the impressed veins on the upper surface coupled with a cuneate base and long pedicel, but the flowers, being white in bud and maturing pink, are also distinctive, so that it ought not to be overlooked, although *Epilobium ciliatum* (American Willowherb) is also often white-flowered.

The species was de-listed before an account had been issued.

Erodium moschatum (L.) L'Hér. (Musk Storksbill)

Erodium moschatum was on the rare plant register 2010-12. It was removed because, although initially considered to be locally scarce, subsequent recording showed that it was widespread and not uncommon. Philp (2010) gave nine tetrad records, providing some evidence of decline, and considered that its presence in arable and waste land was perhaps a relic of its introduction in the former use of wool shoddy as agricultural fertiliser. It has, however, subsequently become widespread on mown grassy verges and banks, especially in suburban situations, and may well have arrived at some of these when originally seeded and be spreading on mowers.

The species was de-listed before an account had been issued.

Euphorbia paralias L. (Sea Spurge)

Euphorbia paralias was on the rare plant register 2011-23. It was removed because, although originally supposed to be locally scarce, subsequent recording showed that it was fairly frequent and perhaps expanding on sandy East Kent shores. It is a Kent axiophyte and so is a worthy species indicative of good habitat. This account is the March 2022 version and has not been updated since. It would, however, be desirable to point out that the historic South Foreland and Lydden Spout records were considered by Francis Rose to be in error for a short, fleshy form of *Euphorbia amygdaloides* (Wood Spurge); he only knew *E. paralias* at Sandwich Bay and Shellness in Sheppey.

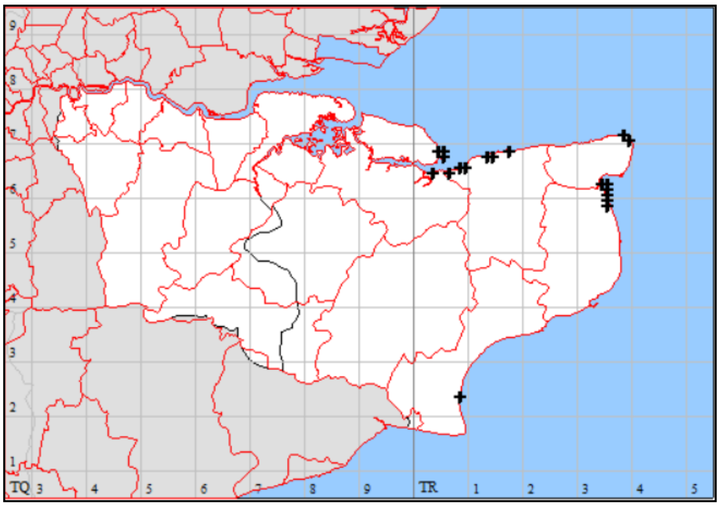
Rarity / scarcity status

Sea Spurge is locally distributed on sandy shores and dunes of the British Isles, but is absent from the east coast north of the Wash and virtually absent all of Scotland. This distribution is fairly stable, and its conservation status is one of 'Least Concern', both in England and in Great Britain as a whole. In Kent, it may well be expanding its range, although it is still more or less **scarce** (and non-existent in West Kent).

Sandwich Bay. Photos by Lliam Rooney, 22 June 2010

Account

The first published record for Kent is by John Gerard in his *Herball* (1597), where he states that 'it groweth by the sea side upon the rowling sande and baich....at Whitstable in Kent, and many other places'. Marshall stated in the *Victoria History of the County of Kent* (1908) that it had 'become extremely scarce owing to the inroads of the sea'. Hanbury and Marshall (1899) listed a number of historic records – including at Queenborough, Sheerness, Reculver, South Foreland and Lydden Spout – but had regarded it as extinct at most of its stations. It is likely, then as now, that its main station remained the Sandwich area, where it has been present since 1632. By the time of Philp (1982), this was considered to be the only locality, albeit present in three tetrads.



Euphorbia paralias (Sea Spurge) 2010-21

The dynamism of its habitats may be responsible both for decline and expansion or re-establishment, given its growth on sandy shore dunes. Since the low point of the 1971-80 survey, it has been found at Swalecliffe and also (Philp, 2010) at Shellness in Sheppey and at the Greatstone dunes, and so should be regarded as scarce, rather than rare, in the county. Indeed, our 2010-21 records amount to 13 tetrads (the equivalent of 19 monads), which raises the issue as to whether it should continue as a rare plant register taxon. This may be as, if not more, plentiful as it has ever been in the county, given that it is likely to have been reasonably well recorded at any time, through the nature of its habitat. In view of the number of records, a distribution map is included here as well as a data table.

Euphorbia paralias is a distinctly fleshy, grey-green perennial which grows deep-rooted in the sand. The other maritime spurge, *Euphorbia portlandica* (Portland Spurge), has thinner leaves with a prominent midrib beneath; but should not be present on the Kent coast (albeit that an inland colony of Portland Spurge, no doubt of anthropogenic origin, was found in 2010). Sea Spurge is adapted to the shifting sands by the anchorage of its tap-root, its ability to throw out long shoots from the root-crown when buried and by the shoots being able to develop side branches to grow through an accumulation of sand. Seeds are spread by explosive dispersal up to 2 metres away, but may spread further through wind or sand slopes. They are also buoyant and so capable of being spread to fresh sites where within reach of the tides, although usually the plant is to be found on the mobile fore-dunes at the upper beach and only sometimes near the strandline. Its Kent habitats include sand with a mixture of shingle, but shingle is evidently not favoured.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Nagden Marshes - South Bank of Swale NR	TR0364		15 September 2021	KBRG meeting	A single young plant on the shell bank TR 034 647.
Shellness	TR0468		29 November 2014	SB	A good number of plants in dunes at TR 04948 68825.
Shellness	TR0567		(1) 12 April 2015 (2) 14 October 2010 (3) 30 May 2010	(1) KBRG meeting (2) SB (3) SP & DG	(2) TR 05311 67672, One plant at top of shell sand beach. (3) TR 0531 6767, one plant by track.
Shellness	TR0568		14 October 2010	SB	Small dune area at top of shell sand beach. One plant at TR 05141 68445, two more at TR 05249 68306. Recorded in this area by FR in 1959.
Graveney Marshes	TR0664		15 September 2021	KBRG meeting	Beach at TR 0619 6482.
Littlestone	TR0823		(1) 17 September 2021 (2) 11 June 2011	(1) SB (2) KBRG meeting	(1) Littlestone dunes. (2) Not uncommon on Greatstone dunes.
West of Seasalter	TR0865		29 April 2016	KBRG meeting	A few plants on the beach at TR 08902 65234.
Seasalter	TR0965		(1) 15 September 2021 (2) 12 March 2017 (3) 29 April 2016	(1) CO (2) AL & JM (3) KBRG meeting	(1) TR0965. (2) TR 092 653, occasional along the beach. (3) A few plants on the beach at TR 0919 6533 and at TR 0900 6525.
Tankerton / Swalecliffe	TR1367		13 December 2016	CO	Not yet flowering on landward side of stream outflow on sandy shingle at TR 135 676.
Swalecliffe	TR1467		(1) 12 August 2021 (2) 22 May 2017 (3) 15 September 2011	(1), (2) & (3) CO	(1) Just one plant left at TR 1435 6775. (2) Two new plants top of shingle beach against seawall. (3) One plant at back of beach against seawall at c.TR 143 677, first noticed before 2010.
Herne Bay	TR1768		30 July 2017	CO	First plant found on East end of harbour beach followed by two more individual plants and small clump of five stems.

Sandwich - Shellness	TR3462		20 June 2011	SB & LR	Dune grassland, TR 34848 62675.
Sandwich Bay	TR3558		(1) 16 July 2013 (2) 27 June 1985	(1) CO (2) RF	(1) Two clumps on shingle beach.
Sandwich Bay	TR3559		(1) 3 July 2016 (2) 6 June 2015 (3) 16 July 2013 (4) 24 June 2010	(1) AW (2) DS (3) CO (4) SB	(1) NNR (2) TR 35630 59622, over 20 plants scattered along beach just above high tide mark, flowering. (3) Common at top of beach. (4) TR 35549 59968, plants scattered in dunes of sand with shingle southwards for 300 metres, declining as shingle takes over from sand.
Sandwich Bay	TR3560		(1) 1 September 2010 (2) 22 June 2010	(1) SB (2) LR	(1) TR 35521 60126, seaward edge of sand dunes and also near drift line on sand and shingle beach. (2) About TR 354 605 to TR 351 617.
Sandwich Bay	TR3561		(1) 1 September 2010 (2) 22 June 2010	(1) SB (2) LR	(1) TR 35362 61007, In profusion on seaward edge of sand dunes, backed by a continuous belt of *Hippophae rhamnoides*. (2) About TR 354 605 to TR 351 617.
Sandwich / Pegwell Bay	TR3562		23 September 2015	KBRG meeting	
Sandwich Bay	TR3658		After 1970, before 1981	Philp (1982)	Recorded as TQ35U.
Cliftonville	TR3871		13 September 2010	CO	One small, non-flowering patch.
Kingsgate Bay	TR3970		(1) 29 June 2021 (2) 14 May 2013 (3) 18 May 2012 (4) 13 September 2010 (5) 28 September 2008	(1) SB (2) SB (3) & (4) CO (5) JoG	(1) Kingsgate Beach, abundant (2) Patch of plants c. 15 x 10m on sand dunes at TR 3956 7063. (3) 50+ clumps on sandy dune area, taking over dune. (4) One patch with six distinct clumps on sand dune area of Kingsgate Bay. (5) TQ 395 706, about 10 plants at sandy beach. Seen also in this area by EGP & BW, but not given in Philp, 1982 or 2010.

Helleborus foetidus L. (Stinking Hellebore)

Helleborus foetidus was on the rare plant register 2011-23. It was removed because, although originally supposed to be locally scarce, subsequent recording showed that it was fairly frequent within the area where it was most likely to be native. In any case its widespread occurrence as an escape from cultivation, and the difficulty of distinguishing between these and 'native' occurrences has meant that it has questionable value in a rare plant register. At best it may be persuasive in calcareous woodland glades or borders, but introduced or escaped plants may be catholic as regards habitat. This account is the March 2022 version and has not been updated since other than in minor respects.

vc 15 and 16

Rarity / scarcity status

The native range of Stinking Hellebore runs down the Welsh Border, across the Severn Vale and Cotswolds, and from Dorset to Kent. It is local throughout, but its conservation status in England and Great Britain as a whole is treated as of 'Least Concern'. It is widely naturalized as a garden escape outside its native range and so the position in Kent is not straightforward, since the presumed native occurrences, centred around the North Downs where breached by the Lower Medway Valley, are to a degree obscured by garden escapes elsewhere and the potential for garden escapes within the native area. Whilst Philp (2010) gives 15 tetrad records, over half of these were reckoned to be non-native, but established, colonies in the wild. Accordingly, this species is treated as **scarce** in Kent, even though there are more records than would normally justify this. However, the difficulty in separating amongst many records presumed native occurrences and escapes is such that the value of including the species in this register is limited.

Boughton-under-Blean. Photo by Lliam Rooney, 3 March 2011

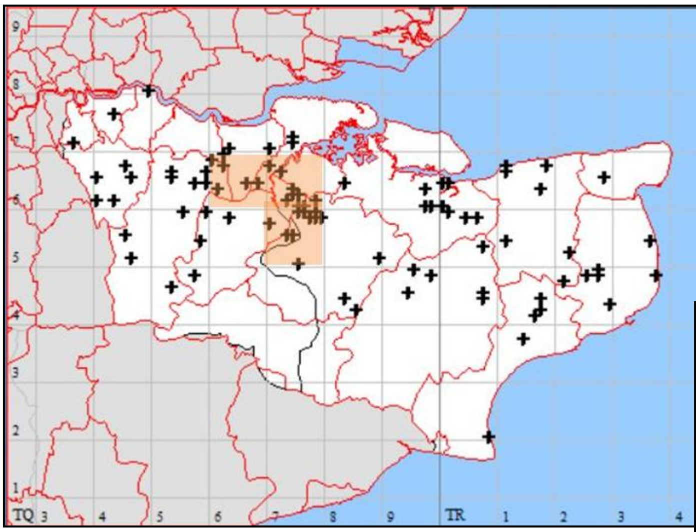
Account:

In Kent, Stinking Hellebore was first published (as Great Bastard black Hellebore or *Helleboraster maximus*) by John Blackstone in his *Specimen Botanicum* (1746) as found 'Among the Cliffs between *Northfleet* and *Gravesend*' by Dr. Wilmer and Mr. Watson. Hanbury and Marshall (1899) regarded the species as being rare and local in bushy places on chalk. As the localities given by them (including what were then historic records) are likely to represent native occurrences, it is worth setting these out: a wood in Chevening Park; chalk hills, Birling; near Cobham; near the large chalk-pit at Halling; Greenhithe; Boxley Hill; by the roadside up the chalk-hill about a mile N.W. from Charing; copses, S. of Rainham. These are all associated with chalk in the north of the county. Boxley and Halling remained the main areas in which records continued to be made (there are specimens in **MNE** from the former location in 1939 and from the latter in the 1940s).

Westfield Wood. Photo by Sue Buckingham, 28 March 2010

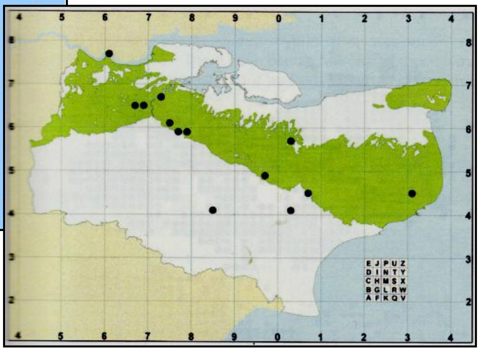
Philp (1982) assessed the species as local and rather scarce, being found in woods and scrub on chalk in the western half of the county, but probably introduced in two localities near Lydden, in the east. Philp (2010) gives a wider scatter of records, some of these fairly random, as might be expected from garden escapes. The species is described as native on the chalk downland around Halling (TQ66S & X), Bluebell Hill (TQ76K) and Boxley (TQ75U & Z), with other colonies probably the result of escapes from gardens, where it is frequently grown and readily sets seed. It is possible that Eric Philp was being selective in only recording well established colonies, as Philp (2010) gives 13 tetrad records overall for 1991-2005 (fairly constant in relation to the 15 tetrads recorded for 1971-1980); but our 2010-21 records amount to many times this, so that either the species is becoming more frequent as an escape, or we are recording what there is more thoroughly (or with a more elastic recognition of what is recordable). These recent records are given in the accompanying 2010-21 distribution map which, however, plots records at monad level, giving 85 different monads. For comparison, the 1991-2005 distribution map provides tetrad data from Philp (2010), with the kind permission of the late Eric Philp and the Kent Field Club.

Records are also given in the following data table, which is restricted to chalk areas of hectads TQ66, 75 and 76 (shown tinted brown on the distribution map), plus selected records from TQ86, on the basis that these are most likely to include occurrences of native status.



Helleborus foetidus **(Stinking Hellebore) 2010-21**

Helleborus foetidus **(Stinking Hellebore) 1991-2005**

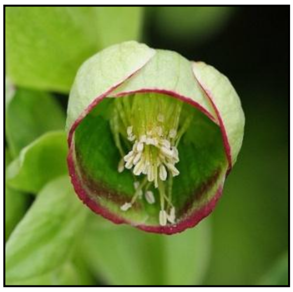


Helleborus foetidus[979] is a short-lived perennial, generally dying after four or five years. It spreads by seed, and reproduction may be adversely affected by mice eating buds, flowers and young seed pods, as well as die-back from fungal attack. Seeds fall immediately around the parent plants, but may be spread short distances by ants. It grows on thin calcareous soils and in Kent grows in and on the edge of woodland as well as grassland with sparse scrub, often on steep slopes. It is evidently shade-tolerant in view of its woodland sites, but it responds well to the source of shade being removed and this may also encourage germination. Substantial increase in numbers may take place after coppicing, followed by a gradual de cline with the return of shade, as observed along the edge of woodland above Upper Halling by Joyce Pitt.

Boxley Warren Woods, habitat. Photo by David Steere, 6 April 2014

It may be distinguished from our other native Hellebore, *Helleborus viridis* (Green Hellebore), which may grow in similar habitats, and from escaped garden species by virtue of bearing palmate leaves on stems (i.e. not basal leaves only) which last through the year.

Escaped garden plants of *Helleborus foetidus* may lack the purple rim around the flower, but this is not definitive and the rim appears on the garden escape at Boughton illustrated here.



Boughton-under-Blean. Photo by Lliam Rooney, 3 March 2011

There is a fly *Phytomyza hellebori* Kaltenbach, 1874 (Diptera, Agromyzidae) which is mainly associated with *Helleborus foetidus* and was added to the British list in 2000 by two independent authors[980]. While the adult flies are small and cannot be identified in the field, the leaf-mines are conspicuous. They were first seen in Kent in 2003 on garden plants, and subsequent Kent records are virtually all from gardens. Mines have, however, been noted on *Helleborus foetidus* at Downe Bank nature reserve in 2010, albeit that this is outside the area which, for the purposes of this account, is taken to be the focus of native occurrence in Kent.

The entomological aspect of this account has benefited from the assistance of Laurence Clemons.

Site	**Grid reference**	**Site status**	**Last record date**	**Recorder**	**Comments**
Hartley	TQ6068		(1) 6 April 2020 (2) 2 April 2014 (3) 4 March 2012	(1) & (2) DS (3) RR	(1) Known clump at Rectory Meadow on chalk grassland (2) TQ 602 685, Rectory Meadow LNR, 2 plants in woodland edge and one in copse. (3) TQ 603 685, Rectory Meadow, Hartley, chalk grassland, two flowering plants. Status uncertain.

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[979] See Rice, G. (1994). Helleborus foetidus L. in (eds. A. Stewart, D.A. Pearman & C.D. Preston) *Scarce Plants in Britain*.

[980] Stubbs, A.E. (2000) The hellebore leaf-miner *Phytomyza hellebori* Kaltenbach (Diptera, Agromyzidae) new to Britain. *Dipterists Digest* (*Second series*) **7:** 33-35 and Welch, R.C. (2000) *Phytomyza hellebori* Kaltenbach (Dip.: Agromyzidae), a recent addition to the British fauna: further records in East Northamptonshire, Huntingdonshire and Cambridgeshire. *Entomologist's Record and Journal of Variation* **112:** 163-166.

North of Stansted	TQ66B		After 1970, before 1981	Philp (1982)	
Ridley	TQ6163		(1) 17 April 2018 (2) 15 November 2015	(1) GK & SK (2) DS	(1) TQ 6142 6372, bottom of wooded/scrubby slope adjoining arable on chalk, groups of 6 and 24 plants looking wild. (2) 50+ plants in bud along chalky border between field and wood edge. Not near habitation or fly tipping, presumed native. TQ 61423 63717.
Hartley Bottom	TQ6267		21 February 2016	DS	Hartley Bottom. 2 flowering plants in chalky road verge, not near any habitation. TQ 62191 67515.
New Barn	TQ6269		20 March 2016	DS	Single plant on chalk under shade on unmade road verge, not near gardens.
Meopham Green	TQ6464		22 February 2001	JP	TQ 640 645, Steele's Wood, Happy Valley.
Ryarsh	TQ66Q		After 1970, before 1981	Philp (1982)	Also recorded in chalk scrub, Ryarsh Downs 1945-51 by FR.
Holly Hill	TQ66R		After 1970, before 1981	Philp (1982)	
Great Buckland	TQ66S		(1) 29 November 2015 (2) Between 1991 and 2000.	(1) DS (2) EGP (Philp, 2010)	(1) TQ6664, in bud, 5 plants, not near gardens. (2) Recorded as TQ66S.
Upper Halling	TQ6864		(1) 13 February 2013 (2) 4 February 2013 (3) 6 April 1992	(1) IS (2) SB (3) VAJ	(1) Halling Woods, TQ 68646 64421 - one plant in flower, three well grown, non-flowering plants nearby, with another 5 non-flowering plants/seedlings further up the bank. Also three more well-grown, non-flowering plants at TQ 68575 64414. (2) (a) 25 plants seen scattered between TQ 68581 64411 & TQ 68587 64343 on steep scarp slope under mixed woodland with *Mercurialis perennis, Iris foetidissima, Taxus baccata* etc. Probably more plants but terrain steep and difficult. (b) 31 plants around TQ 68405 64227, near foot of scarp slope in sparse scrub. Associates - *Iris foetidissima, Primula vulgaris, Corylus avellana, Taxus baccata,* etc. (3) TQ 687 644. Philp (1982 & 2010) recorded this species for TQ66X.
East Malling	TQ7057		1 March 2019	BW	
Ranscombe	TQ7067		(1) May 2020 (2) 14 April 2016 (3) 2013 (4) 9 August 2005	(1) RM (2) JP (3) RM (4) JP	(1) Woodland south of Ranscombe reserve. No count, but plants still present around TQ 702 672. (2) 40 plants in dense secondary woodland south of railway. (3) 71 plants in woodland at TQ 701 672, outside reserve boundary. (4) TQ 702 672
Borstal	TQ7266		2 March 2010	SP	TQ 72768 66577, several plants on roadside bank. Status uncertain. Philp (2010) recorded this species for TQ76I.
South east of Burham	TQ7631		3 June 2017	LR & GK	c. 50 plants on disused chalk quarry floor, of which maybe a dozen had flowered.
Bluebell Hill	TQ7460	KWT RNR	6 March 2010	DM	TQ749607.

Bluebell Hill	TQ7462		12 March 2017	LR & JB	One plant noted at TQ 7460 6262 on the verge of the A229.
Walderslade	TQ7463		7 April 2010	SP	Bridgewood roundabout. Status uncertain.
Westfield Wood, Kits Coty	TQ7560	KWT reserve	(1) 6 April 2014 (2) 7 February 2013 (3) 28 March 2010	(1) DS (2) SB (3) SB	(1) TQ 753 604, over 20 plants at recently tree cleared woodland edge, Westfield Wood. (2) (a) Nine large flowering plants and up to 100 small non-flowering scattered on scarp slope in Westfield Wood from TQ 75453 60382 to TQ 75510 60363, benefiting from recently cleared ash wood and scrub. (b) Four patches of plants around TQ 75632 60470 Westfield Wood in a clearing with around 50 small non-flowering. It appears that plants respond well to clearance of the surrounding dense ash/yew woodland. (3) TQ 75682 60926, Westfield Wood. One plant only, steep slope In chalk woodland. Philp (1982 & 2010) recorded this species for TQ76K.
Walderslade	TQ7562		7 April 2010	SP	Two plants at Walderslade junction of A2. Status uncertain.
Boxley Warren, including Boarley Warren	TQ7659		(1) 9 January 2021 (2) 18 June 2015 (3) 7 February 2013 (4) 26 June 2010 (5) 28 April 2002	(1) SL (2) KBRG meeting (3) SB (4) LM (5) JP & DG	(1) Boarley Warren, north-west of Boxley, TQ 7642 5997 - TQ 7645 5998. On steep scrubby chalk downs. Five plants flowering at these grid references but more seen in immediate vicinity. (2) TQ7659. (3) 30 large plants and many seedlings on steep chalk grassland slope and among scattered brambles from TQ 76718 59889 to TQ 76789 59866, Boxley Warren. (4) TQ 766 598, on steep south-facing chalk grassland slopes. (5) TQ 765 598, Boarley Warren. There are many historic records for Boxley Warren (extending also to TQ7759) and Philp (1982 & 2010) includes TQ75U.
North of Boarley farm	TQ7660		(1) 9 January 2021 (2) 18 June 2015	(1) SL (2) KBRG meeting	(1) Boarley Warren, north-west of Boxley, TQ 7649 6001. On steep scrubby chalk downs. Five plants flowering at the edge of scrub. (2) TQ7660.
Detling, the Larches	TQ7858		(1) 27 May 2021 (2) 11 February 2014	(1) DM (2) DS	(1) The Larches (2) TQ 788 588, two plants on woodland edge bordering chalk grassland.
Detling	TQ7859		(1) 19 June 2015 (2) 10 June 2013	(1) DS (2) SB	(1) TQ 78701 59056, top of chalk grassland slope in scrub edge. (2) Three mature plants and many small seedlings in recently cleared area at TQ 78673 59024.
Detling	TQ7958	KWT RNR	(1) 6 June 2021 (2) 8 March 2011	(1) DM (2) LR	(1) Detling Hill. (2) TQ 79595 58494, Detling Hill, east bound side of the A249. Ten plants, although probably more, on the chalk embankment. Philp (1982 & 2010) includes TQ75Z, and there is a 1952 record for this monad.

Westfield Sole	TQ7861		20 February 2020	DS	Several clumps growing on central reservation of M2 motorway. Seen whilst stationary in traffic. On chalk soil, apparently not planted.
Cox Street	TQ8060 & TQ8160		(1) 6 May 2002 (2) 10 May 1989	(1) JP (2) JP, JW & PB	(1) Beaux Aires and Sherway Wood, TQ 816 607. (2) TQ 8099 6078, although this grid reference may be a 'start point'. A record for TQ86A is given in Philp (1982). Also, FR recorded this species in open woodland amongst bushes on chalk, north east of Lower Cox Farm in 1960.

Hippuris vulgaris L. (Mare's-tail)

Hippuris vulgaris was on the rare plant register 2011-23. It was removed because, although it was originally supposed to be locally scarce, subsequent recording showed that it was fairly frequent. It remains a Kent axiophyte, indicative of good habitat, especially as regards coastal or estuarial grazing marsh dikes. This account is the March 2022 version and has not been updated since.

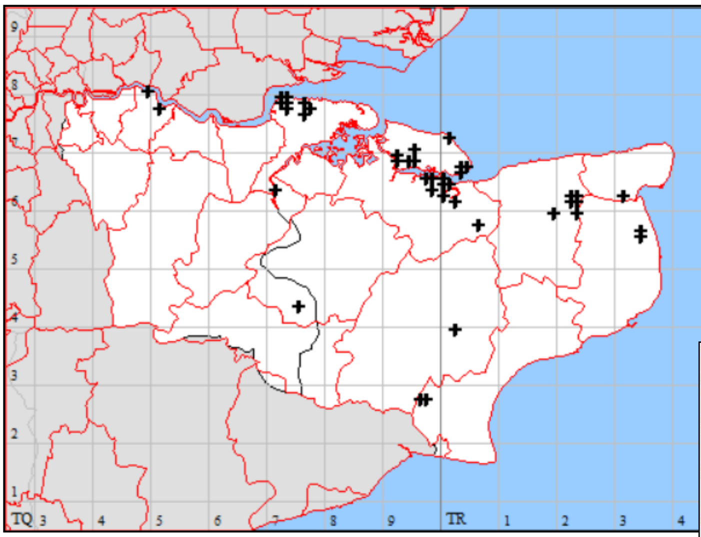
vc 15 and 16

Rarity / scarcity status

Hippuris vulgaris is locally frequent in aquatic habitats throughout the British Isles, especially where waters are base-rich. Its conservation status in England and Great Britain as a whole is one of 'Least Concern'. Its inclusion in the county rare plant register arose because of the relatively few sites listed in Philp (2010), viz. nine tetrads, and the steep decline from the earlier survey in Philp (1982). The first of these reasons may no longer hold good and, with 28 tetrad records in the period 2010-19, it looks as though the second might not either; so this species, apparently neither rare nor scarce in Kent, is being held temporarily in the register pending further assessment.

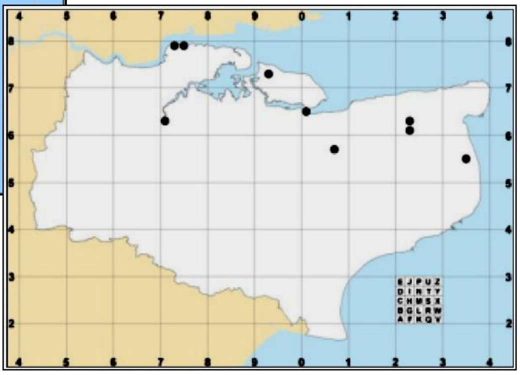
Account:

The first Kent record is by Thomas Johnson in his *Descriptio Itineris* (1632), in travelling from Margate to Sandwich, and is accompanied by several plants of ditches and wet ground, so by this point the botanical party had evidently left Thanet. Hanbury and Marshall (1899)'s set of records is primarily coastal, including in marshes alongside the tidal Thames and Medway, and extended from near Charlton to Folkestone Warren, with only a couple of records well inland (Ashford and Goudhurst). They regarded the species as frequent in marshes and ditches. Philp (1982) gave Mare's-tail in 21 tetrads, being very local in marsh dykes and flooded gravel pits, with a concentration on the Hoo peninsula (Egypt Bay saltings has been a traditional location). There were smaller groupings of records near Sittingbourne; by the Stour; and in the Worth / Hacklinge area. However, Philp (2010) found that it had gone from some earlier sites and only nine tetrads were found to contain the species. These are shown in the accompanying 1991-2005 distribution map (provided here with kind permission of the late Eric Philp and the Kent Field Club). Whilst this ostensibly provides evidence of decline, the diminution is not at all supported by 2010-21 data (30 tetrads, equivalent to 42 monads) and due to the number of recent records, the register site information will accordingly be maintained at 1km square (monad) level.

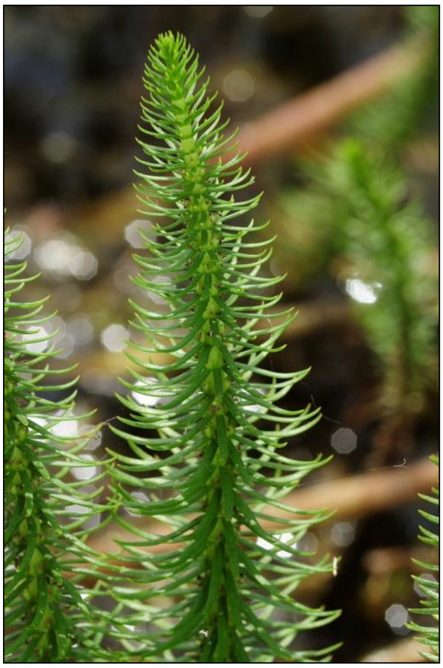


***Hippuris vulgaris* (Mare's-tail) 2010-21**

***Hippuris vulgaris* (Mare's-tail) 1991-2005**

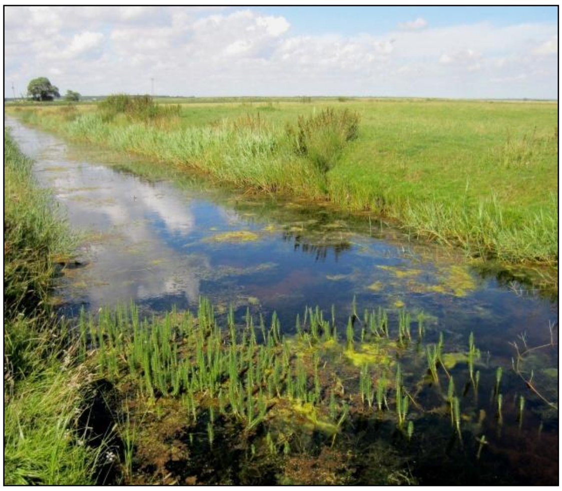


Whilst the general focus of distribution remains in the north of the county, including well spread in Sheppey, new finds have been made around Fairfield in Romney Marsh. The Erith site appears to be a planted one, a 'wild life' pond and so should be disregarded as part of the natural distribution. A couple of other sites are artificial waterbodies, and one cannot be confident about origins, but the species can evidently colonise new sites, as in 2012 it was found in a pool of very recent formation in a fold of the mobile, slumping London Clay cliffs on Sheppey.



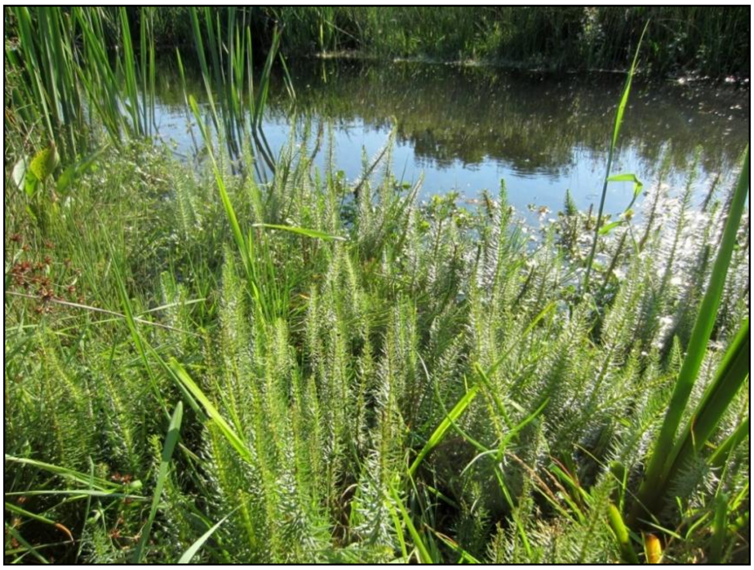
Oare. Photo by Lliam Rooney, 6 July 2010

Mare's-tail's usual Kent habitat, however, is in brackish dykes, fleets or lagoons on grazing marshes, sometimes on the muddy margins or in depressions where the thick, wandering rhizomes may be exposed with changing water levels. The tolerance to changing levels is shared by *Rumex maritimus* (Golden Dock), as at Cooling Marshes. It is the luxuriantly flaccid submerged shoots which most aptly fit both English and Latin names for Mare's-tail. The colonies, due to perennial rhizomatous spread, can be quite extensive: in 2011 it was seen along about 30m of ditch at Stodmarsh, together with *Hydrocharis morsus-ranae* (Frogbit).



Fairfield, Romney Marsh. Photo by Geoffrey Kitchener, 4 August 2013

Mare's-tail might be taken for one of the Horsetails (*Equisetum* spp.), but has its flowers at the base of the leaf whorls and does not bear terminal cones.



Worth Minnis. Photo by Geoffrey Kitchener, 5 September 2013

Laphangium luteoalbum (L.) Tzelev (= *Gnaphalium luteoalbum* L.) (Jersey Cudweed)

Laphangium luteoalbum was on the rare plant register 2011-23. It was removed because, although it arrived in Kent quite recently at bird-frequented waterbodies, possibly without introduction by man (although on the back of a general spread across from Continent), it rapidly developed a distribution as an urban weed, especially on pavements. It became unworthy of conservation, and without merit as a rare plant register species. Tabular records were maintained in the register up to 2019 and provide interesting evidence of spread, but these discontinued after then because the species had become so common. This account is the March 2022 version and has not been updated since. Its spread has continued.

vc 15 and 16

Rarity / scarcity status

Jersey Cudweed is regarded as native in the Channel Islands, where it was first recorded in 1690. Its mainland occurrences are much later, and most are casual introductions; but a history of East Anglian occurrences has led to a surviving population in Norfolk sometimes being treated as native. Although the *British Red Data Books 1 Vascular Plants* (1999) treated the species as a Critically Endangered native, *The Vascular Plant Red Data List for Great Britain* (2005) does not give any assessment of conservation status, but places it in the 'parking list', apparently through uncertainties regarding the species' native/introduced standing generally. *A Vascular Plant Red List for England* (2014) ignores it. Indeed, there is a case for saying that, although it may have arrived naturally so as to be capable of being treated as a native, it 'is categorically unworthy of special protection'.[981]

In Kent, there are two localities where the species has been seen since 1996 and where it may be supposed to have arrived probably without introduction by man, and hence would enjoy native status. It is accordingly regarded as **rare** in Kent, although there are a great number of other locations where, as an urban casual, its status is more equivocal.

Account

The first Kent record for *Laphangium luteoalbum* is at Dungeness on 19 September 1996, and there is an account of the species at that site by Mark Gurney (2004[982]), from which many of the following details are drawn. When first found, by Eric Philp, the colony amounted to several hundred plants growing on an area of pumped silt at TR0618 which had been deposited in a shingle excavation between 1993 and 1994. In 1997 it was found in several scattered locations on the margins of flooded gravel pits, one of them over 1km from the 'original' site. By 1999 it had established itself on the margins of most pits in the area known as the New Excavations, together with the western shores of Burrowes Pit and parts of the ARC Pit, with an estimated total of 100,000 plants. In 2001, there were over 20,000 plants by one of the pits in the New Excavations; and south east of the ARC pit,

Dungeness. Photo by Sue Buckingham, 25 July 2102

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[981] Pearman, D.A. (2007). 'Far from any house' – assessing the status of doubtfully native species in the flora of the British Isles. *Watsonia* **26**: 271-290.

[982] M. Gurney (2004). Jersey Cudweed *Gnaphalium luteoalbum* L. at Dungeness RSPB Reserve, East Kent. *Watsonia* **25**: 107-113.

about 350,000 plants turned the ground grey. The number of plants and their flowering time, however, appear to be influenced by fluctuations in water levels affecting the damp margins, and the ARC pit site numbers dropped in 2002 to 3,000 (in September, none having been visible in May). The species has been recorded in TR0518, TR0618, TR0619, TR0620, TR0718, and TR0719, and the data presented below becomes patchier here after systematic recording in 2007-08 although there is no reason to suppose that the species has not remained present in quantity since

Gurney (2004) canvassed the possibility that seed may have arrived at Dungeness as contamination with the silt pumping equipment, some of which probably came from Germany, where the species is local but widespread. There is also the possibility of wind-dispersal from the Continental side of the English Channel, where it grows. However, the discovery of the plant on an RSPB reserve emphasises the potential for a natural introduction by birds. Thus Wiggington (1999)[983] mentions in this connection that terns, at least, are known to 'commute' between their colonies at Dungeness and those on the coast near Calais.

Sevenoaks. Photo by Sue Buckingham, 2 October 2012

On 8 September 2008, the species was also found by Geoff Joyce at Sevenoaks Wildlife Reserve, TQ 5247 5697, where it was abundant on the sandy edge of the east lake. It has since been seen on sandy man-made islands at the lakes, as well as on the shore. This reserve is over 70km from the Dungeness reserve, but is also very much orientated towards observation and encouragement of birds. It is possible that seed may have travelled with a birdwatcher, but relatively unlikely that the birdwatcher will have reached a part of the reserve where the seed may have germinated on the shoreline. Accordingly, there is a case for regarding the species as having reached this location also by non-anthropogenic means.

By contrast, where Jersey Cudweed occurs as an urban street weed, the potential for this having arisen as an introduction by man is a great deal higher and creates a parallel with the species' occurrence elsewhere in the world as a fairly cosmopolitan urban (and frequently agricultural) weed. Mark Spencer (2010)[984] points out a recent increase in appearances, which include metropolitan vc16 finds at Hither Green in 2007 and Deptford in 2008; and since then it has been seen at Charlton (2012), Northumberland Heath (2014), Barnehurst (2016), Eltham (2016), West Heath (2016), Bexleyheath (2016) and other localities thereafter.

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[983] M.J. Wiggington (1999). *Gnaphalium luteoalbum* L. (Asteraceae). In (ed. M.J. Wiggington) *British Red Data Books 1 Vascular Plants.*

[984] M. Spencer (2010). Botany report for 2008 and 2009. *The London Naturalist* **89**: 117-131.

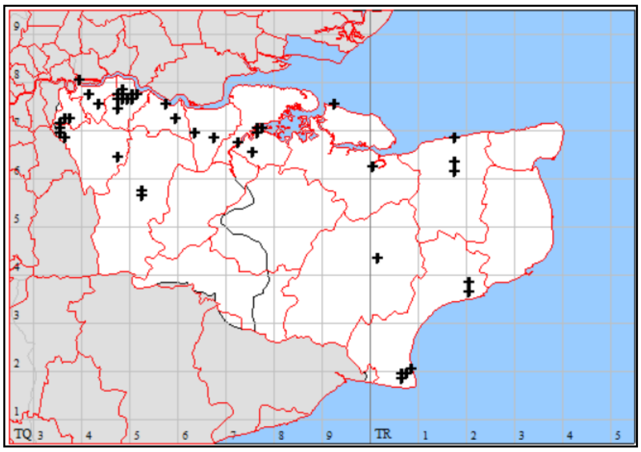
Chatham, as pavement weed. Photo by Sue Poyser, 2017

The habitat preferences of Jersey Cudweed at Dungeness and Sevenoaks are for damp sandy ground, subject to changing water levels. A degree of bare ground, encouraged by seasonal flooding, appears to be required for establishment, the species generally behaving as an annual. Its germination behaviour is variable, so that it may behave as a winter annual, germinating in autumn, overwintering as a rosette and flowering in summer; or it may germinate in early summer, flowering in autumn or even as late as December. Both patterns of behaviour have been exhibited at Dungeness and the large quantities of plants found near the ARC Pit in 2001 appears to have been correlated with exceptionally high water levels in the winter of 2000-2001 inundating sand which had been dry for some years and stimulating spring germination.

Dungeness. Photo by Sue Buckingham, 25 July 2012

The metropolitan occurrences have some parallels in terms of habitat characteristics in that their appearance on pavements and between brick paviors of driveways is in open habitats with limited competition (although there may be an issue of the effectiveness of different species in coping with weedkiller regimes) and often with access to a sandy substrate in which paving-stones or paviors may have been bedded. Whilst the occurrence of the species in Becontree, Essex has been correlated with the laying of brick paviors in front gardens at a time, neither recent nor old, when laying contractors may have used bedding-in sand with a seed-bank of Jersey Cudweed[985], we do not have data enough for evidence of similar origins in vc16.

The following table was maintained for records up to, and including, **2019**. The increasing number of urban occurrences is such that there is minimal value in adding to them. The distribution on a monad basis is shown on the accompanying distribution plan.



Laphangium luteoalbum **(Jersey Cudweed) 2010-21**

Site	**Grid reference**	**Site status**	**Last record date (up to 2019)**	**Recorder**	**Comments**
Penge metropolitan vc16)	TQ3569		1 September 2019	GK	Birkbeck Road pavement, also forecourt at junction of Mackenzie Road and Pelham Road, and forecourt near junction of Pelham Road and Birkbeck Road.
Penge metropolitan vc16)	TQ3571		1 September 2019	GK	Tannsfeld Road, pavement.
Beckenham (metropolitan vc16)	TQ3668		24 April 2019	RMB	Very large plant by way to garage of 1 Groveland Road TQ 3658 6875
Bell Green,	TQ3672		2 August 2019	GK	Pavement, at junction of Datchet

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[985] M.J. Crawley (2016). *Urban botanising I and II: Welwyn Garden City 6th September (v.c.20); and Becontree 13th September (v.c.18).* Field meeting reports 2015. *BSBI Yearbook* 2016.

Bellingham metropolitan vc16)					and Aldremoor Roads, also at Burford Road.
Deptford (metropolitan vc16)	TQ3772		(1) 2 August 2019 (2) 2008	(1) GK (2) NB	(1) Abundant at frontages of 84/86 Randlesdown Road, and occasional on nearby pavements. (2) TQ375772, a single plant outside the Creekside Centre.
Hither Green (metropolitan vc16)	TQ37		2007	NB	
Greenwich peninsula (metropolitan vc16)	TQ3980		17 July 2019	CB	TQ 3910 8034, a small scrappy plant.
Charlton (metropolitan vc16)	TQ4177		(1) 22 July 2015 (2) 26 April, 16 May, 28 May 2012	(1) & (2) JC	(1) Over 300 plants along Canberra Road. (2) TQ414775 to TQ417775. On pavements at Canberra Road, outside nos. 25-33 and 42 (26 April) and on brick paviors of front gardens at nos. 39, 42 and 53 (16 May). Pavement plants weed-killed by Council and in part concreted over.
Eltham Park	TQ4375		27 July 2016	RMB	Paving blocks in front of 180 Glenesk Road, Eltham NE.
Bexleyheath	TQ4776		(1) 14 August 2017 (2) 27 April 2107 (3) 16 July 2016	(1) MR (2) MR (2) RMB	(1) Gipsy Road (Front Gardens of 332 and 334 ,c. TQ 47716 77092 . (2) TQ 47267 76940, Okehampton Crescent, mostly growing in paved front gardens although there were a few on the pavement and a singleton in an alleyway. Present in the garden of No. 97, then (west to east), scattered about up to No. 121, which may be a point of origin, then from No.145 to No. 149 inclusive, No. 157, No. 165 and No. 211. (3) TQ 4759 7613 - many on brick paving at 133 Gipsy Road and crazy paving at no.135, 1 at no.157.
Bexleyheath	TQ4777		(1) 15 May 2018 (2) 1 May 2018 (3) 16 July 2016	(1) MR (2) MR (3) RMB	(1) Footpath between The Quadrant and Long Lane c. TQ 47855 77134. (2) Lessness Avenue (Front Garden of No. 38, TQ 47815 77508. (3) Crazy paving of 197 Axminster Crescent TQ 4768 7710.
Bexleyheath	TQ4876		(1) 15 August 2017 (2) 8 August 2017	(1) & (2) MR	(1) TQ 4844 7634, paved front garden of 7 Stanhope Rd. (2) TQ 48445 76894, three plants on central island of roundabout connecting Long Lane, Hythe Avenue and Pickford Lane.
Bexleyheath	TQ4877		(1) 7 May 2018 (2) various dates, July 2017 (3) 17 May 2016	(1), (2) & (3) MR	(1) Footpath between Bedonwell Road and Edwin Close c.TQ 48700 77643. (2) a singleton, Stapleton Rd; a singleton, Clovelly Rd; a few scattered along Pembury Rd;a singleton, Chessington Avenue; a singleton, Westbourne Rd; a few at Cumberland Drive. (3) TQ 48229 77391, a handful of plants beside residential road, north side of Barry Avenue near junction with Cumberland Drive.
Bexleyheath	TQ4976		3 September 2016	CR	TQ 49719 76001, Silverdale Road, Bexleyheath, street weed.
Barnehurst	TQ5076		25 October 2016	CR	One plant near the junction of

					Parkside Avenue and Old Manor Way, Barnehurst, at TQ 50651 76087. Also, c.12 in front garden paving at No. 27 Parkside Avenue at c. TQ 50731 76099
Northumberland Heath (metropolitan vc16)	TQ5077		26 July 2014	LNHS meeting	Residential frontage in Hind Crescent, TQ 5051 7741.
Sevenoaks Wildlife Reserve	TQ5256, TQ5257	KWT managed reserve	(1) 29 September 2016 (2) 2 October 2012 (3) 8 September 2008	(1) DCh (2) SB (3) GJ	(1) TQ 568 520, all over sandy areas next to lake. (2) Prolific on sandy man-made islands in the lake at TQ 5206 5684 and also on the shore at TQ 5245 5698 and TQ 52448 57001. (3) Abundant on the sandy edge of the east lake, TQ 5247.5697.
Stone Marshes	TQ5775		25 July 2015	RMB	TQ 5776 7520, between paving blocks of unused vehicle holding area at east end of freightliner terminal.
Istead Rise	TQ6369		18 August 2016	RMB	Pavement, 25-31 Castlefields. Istead Rise.
Chatham - Horsted	TQ7565		4 June 2018	SP & DG	TQ 7578 6584, growing between block paving on a garage forecourt
Chatham Maritime	TQ7669		8 June 2019	DS & EW	Five plants seen c. TQ 7612 6983 at base of a wall as a pavement plant, one about to flower.
Chatham marina	TQ7670		17 September 2019	DS & EW	Single large flowering plant on pavement, TQ 7635 7015
St Mary's Island	TQ7770		7 September 2017	SP & DG	50+ plants growing among block paving at TQ 7706 7084 over c. 20sq m; 1 plant at TQ 7716 7024; and 1 plant at TQ 7717 7061
Dungeness	TR0518, TR0618, TR0619, TR0620, TR0718, TR0719	RSPB reserve	(1) 1 August 2019 (2) 13 October 2016 (3) 25 July 2012 (4) 28 August 2010 (5) 19 July 2010 (6) 5 November 2008 (7) 30 October 2008 (8) 7 October 2008 (9) September 2007 (10) September 2007	(1) AWi (2) SLP (3) SB (4) TI (5) JA and LR (6) PA (7) PA (8) PA (9) DR (10) RG	There are numerous records from 1996 onwards of which the following are the more recent, data for earlier surveys being given in the account text above, based on Gurney (2004) and deriving ultimately from RSPB surveys. (1) TR0618, TR0719 (2) (a) TR 07244 19276, hundreds of young plants (leaf rosettes only) in possibly scraped area at edge of flooded pit; also about 15 strong flowering plants nearby at TR 0729 19270. (b) TR 06450 18347, about 10 flowering and seeding plants on the shingle 'beach' of a spit, western side. (c) TR 06154 18460, several plants in wet sand area, struggling to compete with *Crassula helmsii*. (2) Present, TR 065 184. (3) TR0719. (4) 150 plants coming up not yet in flower TR 06753 18118. (5) TR 059181, 1500 plants growing on top of three islands at east end of excavation area. (6) TR 064180, 150 plants at south end of lake on pumped silt. (7) TR 075193, 6210 plants; TR 0666 2008, 10 plants at water tower pits; TR 064183, 50 plants at new excavations; TR 065195 (centroid), Pete Akers, 50 plants on sandy land near pools beside road

					near ARC hide; TR 0666 1982, Pete Akers, 500 plants scattered on sandy areas at base of peninsula. (8) TR 070185, 4,300 plants at Burrowes Pit; TR 067197, 23,065 plants at west end of ARC pit. (9) TR 075193 (centroid), 25,000 plants at east end of ARC pit.
Lade	TR0820		(1) 27 August 2016 (2) 29 July 2015 (3) 5 September 2013	(1) & (2) DS (3) TI	(1) Only 3 plants seen, appears to have been sprayed with weedkillers recently on the RH&DR railway tracks. TR 08446 20655. (2) TR 08448 20651, three plants flowering by railway tracks. (3) Alongside railway line at Lade – a potentially significant extension from the gravel pit-related sites at Dungeness.
Folkestone	TR2306		25 August 2018	HS	Several plants in the gutter of Ilex Road at TR205 367

Limbarda crithmoides (L.) Dumort. (= *Inula crithmoides* L.) (Golden-samphire)

Limbardaa crithmoides was on the rare plant register 2011-23. It was removed because, although it was originally included on the basis of national scarcity, the BSBI's reassessment in the course of its Atlas 2020 project removed that status. It remains a Kent axiophyte, indicative of good habitat, especially as regards coastal or estuarial margins and upper saltmarsh. This account is the March 2022 version and, except as regards insect data, has not been updated since.

vc 15 and 16

Rarity / scarcity status:

Limbarda crithmoides is a local plant of coastal habitats in southern parts of the British Isles. Its conservation status is regarded as one of 'Least Concern', both in England and Great Britain as a whole; but it is a **nationally scarce** species. North Kent is one of the areas in which it is most abundant, and it warrants no particular rarity/scarcity designation in the county.

Account:

Golden-samphire enjoys very early notice in the county, being recorded by John Gerard in his *Herball* (1597) as Crithmum Chrysanthemum or Golden Sampier which 'groweth in the mirie Marsh in the yle of Shepey, as you go from the Kings ferrie to Sherland house' (presumably Shurland Hall, Eastchurch). Except for orthography, this description of distribution remained unaltered in Thomas Johnson's 1633 edition of the *Herball*. Johnson had himself seen it at Sheppey, listing it in his *Iter Plantarum* (1629) amongst plants such as *Atriplex portulacoides* (Sea-purslane) and *Salicornia* sp. (Glasswort) around Sheerness, after his botanical party had survived interrogation by the Mayor of Queenborough, who was suspicious of the group's motives.

Oare. Photos by Lliam Rooney, 19 August 2010.

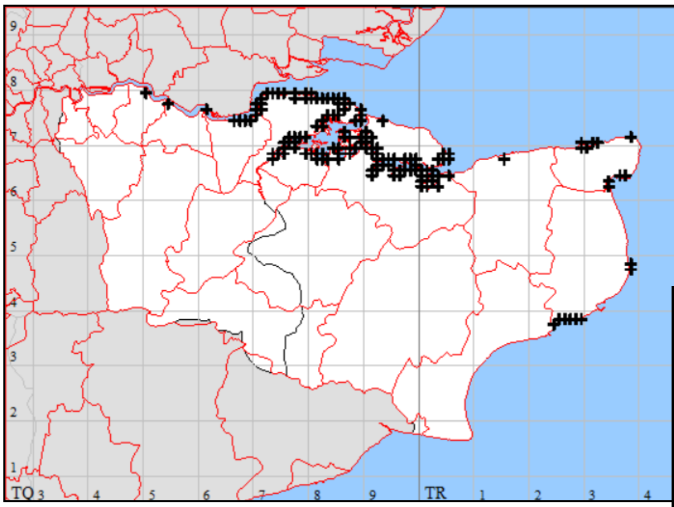
Hanbury and Marshall (1899) regarded *Limbarda crithmoides* as rare and very local on muddy coasts (so the position has changed since then) , listing it (as well as at Sheppey) on the mainland coast in locations from Rainham to Faversham and Seasalter. Habitats included creeks and ditches, and it was reported by C.P. Hurst for the 1899 Flora as being abundant at Conyer's Creek. Abundance below Rainham can also be inferred from the Flora's listed records, although these do not include a collection by Joseph French in 1848 at the marshes there (specimen in the University of Birmingham herbarium).

Francis Rose considered it to be a native of well-drained upper parts of salt-marshes, both on firm alluvial mud and on sand, usually with *Atriplex portulacoides* (Sea-purslane), *Elymus athericus* (Sea Couch) and *Festuca rubra* (Red Fescue), and on stone-faced sea walls, common and abundant locally in the Thames-Medway-Swale estuarine system from High

Halstow on the Thames and above Upnor on the Medway, to Seasalter; also on chalk cliffs, very rare and only known at Minnis Bay and Folkestone warren.

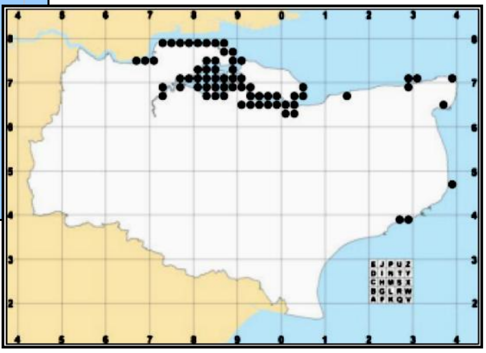
In the 1971-80 county survey (Philp, 1982), Eric Philp described it as very local, but often frequent where it does occur. That survey gave records for 63 tetrads, and the 1991-2005 survey (Philp, 2010) evidenced a fairly similar distribution, with 67 tetrads. The position is again broadly similar as regards 2010-21 records, with 81 tetrads (148 monads), so that the distributional status is fairly stable and, if anything, increasing.

As Golden-samphire is not uncommon in Kent, the distributional data maintained in this register will be at 1km square (monad) level. This will entail recording at a finer scale than the tetrads given in Philp (2010), from which the following 1991-2005 map is taken (with kind permission of the late Eric Philp and the Kent Field Club).



***Limbarda crithmoides* (Golden-samphire) 2010-21**

***Limbarda crithmoides* (Golden-samphire) 1991-2005**



It may be that the species has become more common in Kent since 1899 (or, indeed, 1930), since its presence was not then recognized along the Thames estuary on the north of the Hoo peninsula and towards Eastcourt Marshes; nor on Thanet and down the coast as far as Folkestone. It is possible that sea wall construction or improvement has provided suitable habitat for Golden-samphire, although the reverse might have been expected, and it does not provide an explanation for some of the newer locations.

Hoo, shoreline habitat. Photo by David Steere, 31 July 2015.

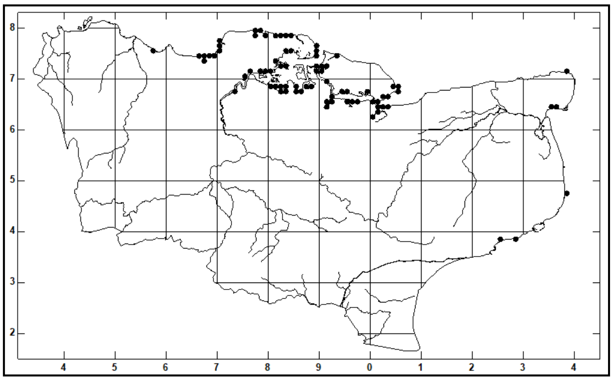
Limbarda crithmoides is frequently found in linear populations along the north Kent coast, particularly by the Thames, Medway and Swale estuaries just within reach of high tides. These populations may be extensive: in 2010 it was recorded as an almost unbroken chain along the coastline between Harty Ferry (Oare) and Conyer Creek. It may be found within the north Kent saltmarshes, amongst saltmarsh plants such as *Atriplex portulacoides* (Sea-purslane) *Limonium vulgare* (Common Sea-lavender) and it may line the channels there. More often, however, it is seen growing along the upper reaches of saltmarsh, merging into the spring high tidemark habitat where it also grows extensively in the absence of saltmarsh. It has been recorded at the base of sea walls (on the maritime side); within the sea wall sloping stone batter; and at the crest, where land vegetation begins. Occasionally, it appears alongside saline ditches landward of the sea wall, and it has been recorded further inland near Faversham, by a sandy track over 400m inland from Oare Creek.

Unusually, it appears scattered on the East Kent chalk cliffs, a habitat which was not observed at all by the earlier botanists in Kent and which appears[986] to be a habitat type found in Kent and westwards in Great Britain from Purbeck. The earliest such sighting appears to have been by Francis Rose, who collected material in 1947 from chalk cliffs by the sea at East Wear Bay, Folkestone; and this may have been the location within the more exposed cliff zone subject to spraydrift with halophyte vegetation mentioned in Rose & Gehu (1964)[987]. We now have records from 2010 onwards, not only for the base of chalk cliffs at East Wear Bay, but also at Samphire Hoe, Ramsgate, Cliftonville, Westgate, Birchington and at the base of cliffs on the edge of a small salt marsh created by a break in sea defences at Kingsdown. Rodwell (2000)[988] points to the possibility of there being distinct ecotypes of *Limbarda crithmoides* in view of the striking difference in distribution of the saltmarsh and maritime cliff vegetation communities.

Grain, sea wall habitat. Photo by David Steere, 23 June 2015.

Limbarda crithmoides should not be capable of confusion with other species, but a non-flowering plant might resemble *Suaeda vera* (Shrubby Sea-blite), which is rare in Kent. Both have succulent leaves (as with many plants which need to store water in a saline environment), but those of *Inula crithmoides* are somewhat toothed.

A fly, *Myopites eximius* Séguy (sometimes given as *eximia*), known globally only from the coasts of northern France, including the Channel Islands, and the coasts of southern England and Wales, is associated exclusively with *Limbarda crithmoides*. Larvae form galls in the capitula, which become thickened and enlarged, with a hard woody texture, within which the larvae are cocooned. The first known Kent record was in 1939, and after 1950 there appears to have been a gap in sightings until 1982. The cumulative position to 2022 as regards Kent records (77 of them) is illustrated in the accompanying monad map which necessarily is also a record for the presence of *Limbarda crithmoides.*



Myopites eximius, Kent monad records

This account has benefited greatly from the assistance of Laurence Clemons as regards the insect associations of the plant.

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[986] Malloch, A.J.C. (1994), *Inula crithmoides* L. . in eds. Stewart, A., Pearman, D.A. & Preston, C.D., *Scarce Plants in Britain,* JNCC.

[987] Rose, F. & Géhu, J.M. (1964), Essai de phytogéographie comparée. La végetation du Sud-Est de L'Angleterre et ses analogies avec celle du Nord de la France. *Bulletin de la société botanique de France 90ème session extraordinaire:* 38-70.

[988] Rodwell, J.S., ed., *British Plant Communities* vol.5, Maritime communities and vegetation of open habitats.

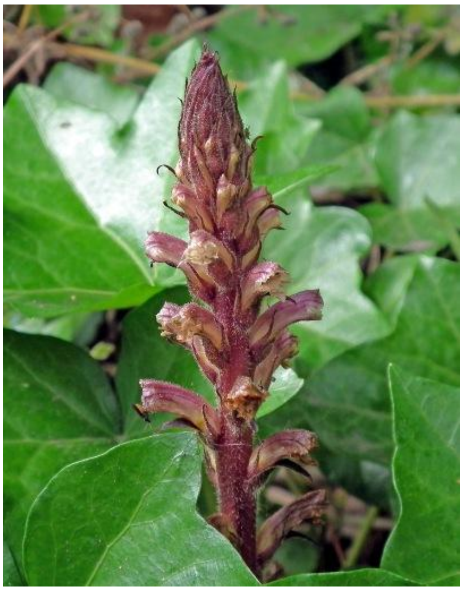
Orobanche hederae Duby (Ivy Broomrape)

Orobanche hederae was on the rare plant register 2011-23. It was removed because, although it was originally included on the basis of local rarity, for some years it has been apparent that it is longer rare or even scarce in the county. This in part drives from gradual expansion from the Stone / Greenhithe area, once critical mass in that area had been achieved. It also seems that increased amenity planting of ivy cultivars is encouraging the broomrape in metropolitan habitats. This account is the March 2022 version and has not been updated since.

vc 15 and 16

Rarity / scarcity status

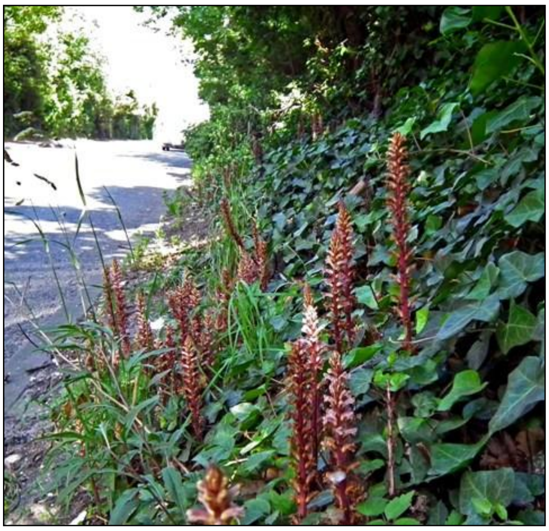
Ivy Broomrape is widespread but scattered in the British Isles, primarily a southern and western plant, barely reaching Scotland. It grows as a parasite on *Hedera helix* (Common Ivy) and on *Hedera hibernica* (Atlantic Ivy). Its conservation risk status in England and Great Britain as a whole is one of 'Least Concern'. In Kent, its previous history and the existence of only two sites recorded in Philp (2010) would lead one to suppose that it is rare, but as a result of subsequent recording it is being treated as **scarce**. Indeed, strictly it is now more common than the criteria for scarcity (ten sites or less) admit, but the species is retained on the register in view of its history of rarity.



Stone. Photo by David Steere, 22 June 2015

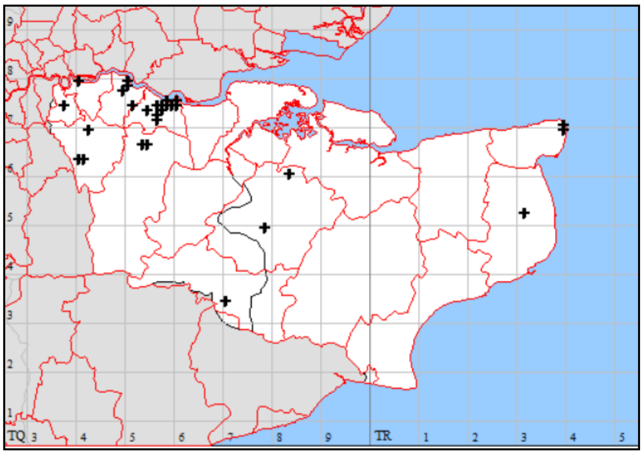
Account

Hanbury and Marshall (1899) give the first published Kent record for *Orobanche hederae* as a find by Borrer in East Kent mentioned in Watson's *Topographical Botany* (1873), but the publication was not until the enlarged second edition of 1883. That publication was preceded by John Stuart Mill's 1868 gathering of a specimen in a wood on the side of the chalk hills near Shoreham. Otherwise, Hanbury and Marshall knew of no other Kent records except a claim by George Wollaston who gave no details and died as the Flora was being prepared for publication. It was also extremely rare when Francis Rose was gathering records for his unpublished Flora. He noted it as found in West Kent in 1948 by Mounts Road, Greenhithe (one spike). In East Kent, it was recorded among ivy in woods east of the A2 at Kearnsey, Dover by Miss J. Gibbons; Rose also saw it on ivy in a chalk hedgebank at Knowlton, north of Dover, 1949-50 (one spike), and among Ivy at Willow Wood north of Sutton (north of East Studdal would be more accurate) in 1955 (one spike).



Greenhithe, habitat. Photo by David Steere, 27 June 2014

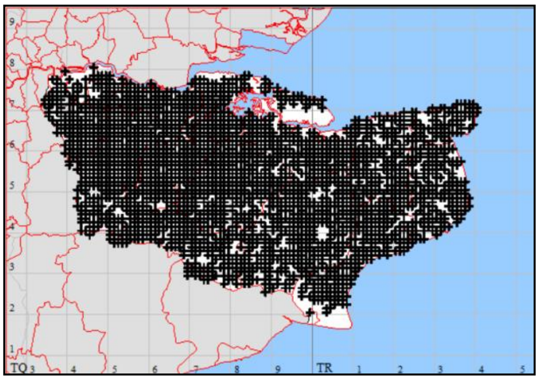
Its rarity continued into the survey period of Philp (1982), 1971-80, when it was seen in two tetrads in the general area of Francis Rose's 1948 find: on scrubby roadsides at Stone (TQ57S) and on the side of a chalkpit at Greenhithe (TQ57X). The Stone site continued so as to contribute to Philp (2010) for the period 1991-2005, and there was also a sighting in East Kent, a laneside at Stockbury (TQ86F). Remarkably, that position has changed: for 2010-19 there have been 20 tetrad records, the equivalent of 27 monads. Some records have been made in metropolitan West Kent, which was not covered by either of Eric Philp's Kent surveys, but the increase is independent of their contribution. It is not easy to assign a reason for this increase. There has probably been an increase in amenity planting using *Hedera hibernica* and various ivy cultivars (the Broomrape has been seen on variegated ivy at Darenth Valley hospital), which offer more scope for *Orobanche hederae* in built-up areas, but this does not account for the general increase as ivy habitats are so widespread. The number of recent records in the area of Dartford, Greenhithe, Stone and Swanscombe suggests that once the plant has become sufficiently established, then the potential for the tiny, wind-borne seeds to give rise to associated colonies increases exponentially. Observations were made of the North Foreland colony, which began as seven spikes in 1986 and started to expand around 2001, although not included in Philp (2010), and attained about 600 spikes in 2011.



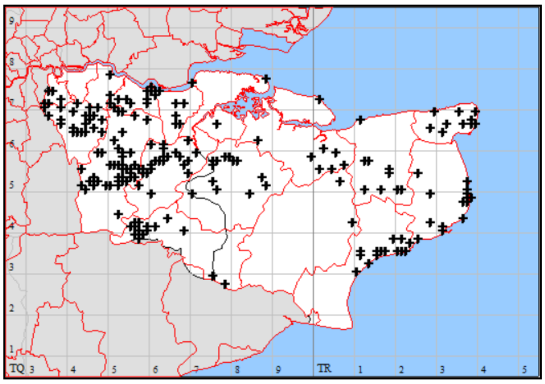
***Orobanche hederae* (Ivy Broomrape) 2010-21**

In view of their number, current records are being maintained on a map basis, given here, and it will be seen that the main cluster is in the north west of the county. Many are on chalk, although there are anomalous records, one being a roadside colony on the Hythe Formation at Wierton, the other on a roadside bank at Kilndown on the Tunbridge Wells Sand Formation; also, there are metropolitan occurrences, which appear indifferent a regards substrate. Setting these anomalies aside, the preference of *Orobanche hederae* for chalk of course appears unrelated to the distribution of its host, *Hedera*, which grows across the county except for some of the marshland of Dungeness and the north Kent coast. Ivy Broomrape is said to have a preference for *Hedera hibernica* as a host, which may explain the western bias of both species' national distribution.

Of our 2010-21 records, seven had *Hedera hibernica* as the host, and eight had *Hedera helix* sensu stricto; so we do not have evidence of any particular preference. Nor do the respective distributions of those two taxa (see maps) shed any particular light on the Ivy Broomrape's distribution (note that the *Hedera hibernica* map is very different from that in Philp (2010), which admitted to under-recording; also, the *Hedera helix* map probably includes records which may not have been properly differentiated from *Hedera hibernica*). *Orobanche hederae* is not restricted to these species, and in 2020 was seen growing vigorously on laneside frontage plantings of *Hedera colchica* 'Sulphur Heart' and *H. colchica* 'Dentata Variegata', near Keston, with only a few weak Ivy Broomrape shoots found on *Hedera helix* at the same location.



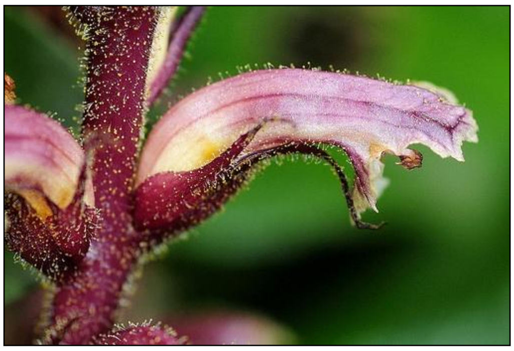
***Hedera helix* (Common Ivy) 2010-21**



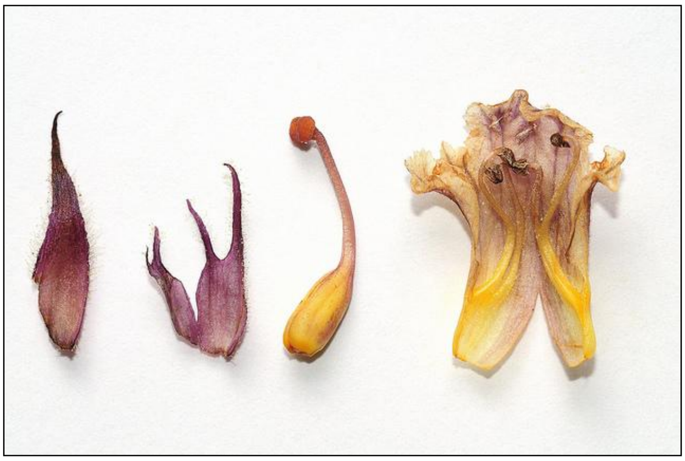
***Hedera hibernica* (Atlantic Ivy) 2010-21**

In contrast to the single spikes recorded in Francis Rose's data, we now have about ten colonies carrying at least 50 spikes each. The variety of ivy habitats is also reflected in the variety of the Broomrape habitats. Our 2010-20 records show it in artificial sites (amenity plantings) and 'natural' woodland; on roadsides and pathsides; and on exposed, open coastal cliff slopes and well into shady woodland. There is one case, however, at Erith in 2017, where no ivy was seen in association and, indeed, no potential host plant was evident at all.

An initial identification of *Orobanche hederae* will normally be from its association with ivy, and in shady localities there may well be little else present by way of potential host. Features which may confirm that identity, and in particular distinguish it from *Orobanche minor* (Common Broomrape), include the narrowing of the corolla shortly before the mouth and the normally yellow colour of the stigmas (although the stigmas of *O. hederae* can sometimes be pink-tinged and there is a form of *O. minor* with yellow stigmas). *O. hederae* is often much taller than *O. minor*, and tends to flower all the way up from the base, so having a much more spread-out inflorescence, and is topped by a 'bud' of unopened flowers. However, the differences between *O. hederae* and *O.minor* are not great, and it has been questioned whether it should be given specific or subspecific rank.[989]



Kingsgate. Photo by Lliam Rooney, 7 August 2012. Note the constriction in the centre of the corolla.



Material from Kingsgate. Photo by Lliam Rooney, 8 August 2012. Left to right: bract; calyx-segments; stigma (yellow lobes); corolla, showing stamens inserted well above the base.

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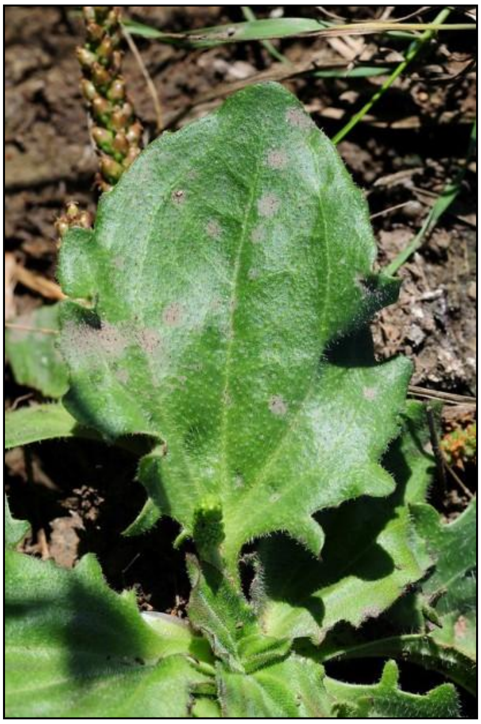
[989] Rumsey, F.J. (1998). Taxonomic problems in the *Orobanchaceae* – the British perspective, *The Naturalist / Yorkshire Naturalists Union* **123**: 50-53.

Plantago major L. subsp. *intermedia* (Gilib.) Lange (Greater Plantain)

Plantago major subsp. *intermedia* was on the rare plant register 2011-17. It was removed because, although it was originally included on the basis of local scarcity, enough recent records had been accumulated to confirm that it was not in fact scarce. It may well be that inclusion in the rare plant register had stimulated recording attention which had otherwise been limited. It is not uncommon (as var. *salina*) in Kent brackish grazing marshes, it is less fully recorded (as other varieties) inland.

The species was de-listed before an account had been issued.

Elmley, Sheppey. Photo by Lliam Rooney, 27 August 2013



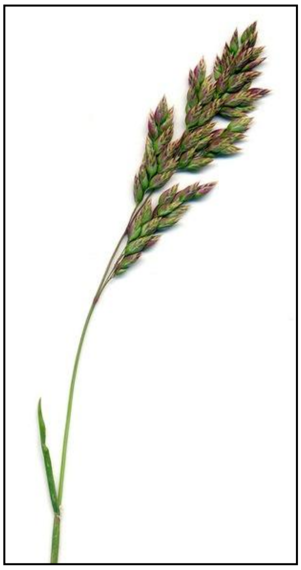
Poa bulbosa L. (Bulbous Meadow-grass)

vc15 and16

Poa bulbosa was on the rare plant register 2011-23. It was removed because, although it was originally included on the basis of national scarcity, this status was removed in 2023 in view of national data collected 2000-19. This account is the March 2022 version and has not been updated since.

Rarity / scarcity status

Poa bulbosa is a generally coastal grass of the Channel Islands, southern England and Wales, virtually absent from Ireland. Its distribution appears stable and its threat status for conservation purposes is regarded as one of 'Least Concern' in England and in Great Britain as a whole. It is listed as **nationally scarce**, but in Kent it is neither rare nor scarce.

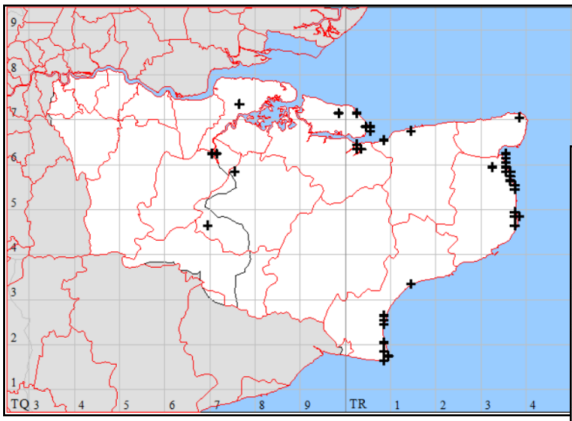


From Seasalter. Photo by Lliam Rooney, 29 April 2016

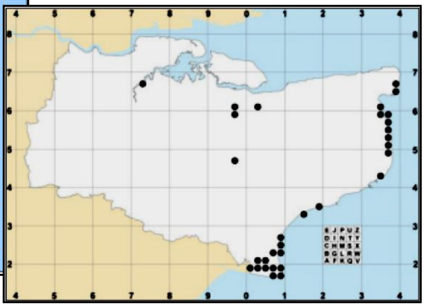
Account

It is first mentioned for Kent by Lewis Dillwyn in his *Catalogue of the more rare Plants found in the Environs of Dover, with occasional Remarks (*1802) as 'Among the sand-hills between Deal and Sandwich', where it is still frequent. Hanbury and Marshall (1899) thought it very rare and gave only one other definite record, between Sandwich and Pegwell Bay. They mentioned another near the top of Shooter's Hill in 1793, which they dismissed (although it is not out of question an error) and a report by J.E. Little between Penshurst and Maidstone (a 'most unlikely station' – which it is, and Little subsequently disowned this, a schoolboy record for which he had not sought publication).

It is improbable, however, that *Poa bulbosa* was then confined to the Deal/Sandwich/Pegwell Bay area and Francis Rose, writing in the 1940s/60s, recognised it as a grass of fixed dunes and old dune pastures, turfed shingle beach and sandy cliffs, being locally abundant further down the east coast, as well as at Swalecliffe beach in the north. It was abundant at the west end of Folkestone Leas in 1946; west of Hythe; by the A259 at Romney Warren (1947-62); on Littlestone beach; and abundant north of Dungeness lighthouse 1948-68. The distribution given in Philp (1982) for 'firm sandy areas near the coast' is not fundamentally different, but a great deal more was found in the Dungeness area – extending to eight out of the ten tetrads in TR01 which include at least some land. An overall total of 21 tetrads was recorded. The grass appeared to have spread, or become better recognised, by the 1991-2005 survey of Philp (2010), when 31 tetrad records were made, an increase of 52%. It had now been found on Thanet, at Rochester (vc15) and at several sparsely vegetated firm sandy areas inland. The 1991-2005 distribution is mapped here, with kind permission of the late Eric Philp and the Kent Field Club.

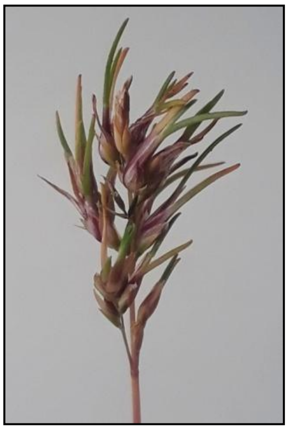


Poa bulbosa (Bulbous Meadow-grass) 2010-21



Poa bulbosa (Bulbous Meadow-grass) 1991-2005

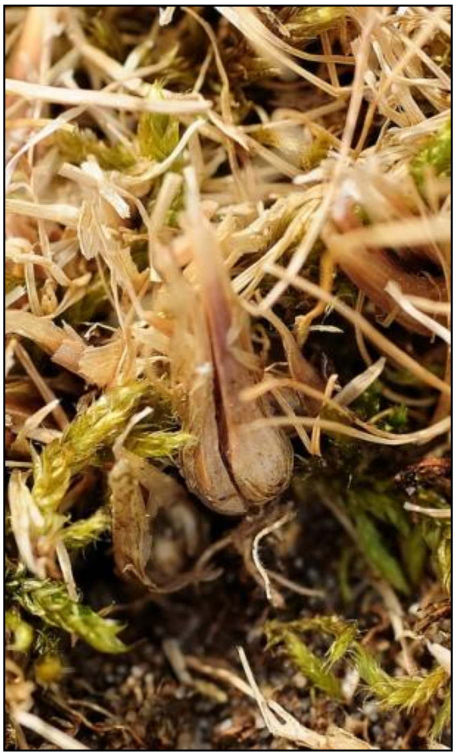
Our 2010-21 records are maintained in this register on a 1km square (monad) base and are mapped here as 39 monads, equivalent to 29 tetrads. This does not appear to be indicative of any decline: the failure to pick up more recent records at Dungeness is likely to be an issue of recording, given that the habitat is unlikely to have changed materially; also, we have not been able to locate some of the earlier inland records. However, the grass has now been seen for the first time in West Kent (made chalky/gravelly ground on the west bank of the Medway at Holborough, 2014, followed by further sightings elsewhere); and is on Sheppey (coastal path, upper beach and inland road verge) and the Hoo peninsula. It is difficult to know how far new populations have simply been overlooked and how far, given that well-trodden paths are a frequent habitat, it may have been introduced by the passage of feet or wheels, the latter almost certainly the case with inland roadside plants at Queen Street, Paddock Wood (2019).



Var. *vivipara*, from Sandling. Photo by Daphne Mills, 29 April 2019

It is a small and very inconspicuous perennial which starts growth in autumn, triggered by short day-periods, flowers early (March to May) and withers rapidly afterwards, so that only the swollen bulb-like stem bases remain. It is these which are most frequently seen and by these the plant is identified. The 'bulbs' are capable of being dispersed by wind some tens of metres[990], if the grip of the roots is loosened by decay, erosion of the substrate or disturbance. The flowers may be normal or proliferous; the latter (var. *vivipara*) has been recorded inland, at Sandling (2019).

Queen Street, Paddock Wood, roadside. Photo by Sarah Kitchener, 5 May 2019



Littlestone. Photo by Lliam Rooney, 5 June 2010

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[990] Gray, A.J. (1994). Poa bulbosa L. Bulbous meadow-grass. In (eds.) Stewart, A., Pearman, D.A. & Preston, C.D. *Scarce Plants in Britain*, JNCC Peterborough.

Poa infirma Kunth (Early Meadow-grass)

vc15 and 16

Poa infirma was on the rare plant register 2011-23. It was removed because, although it was originally included on the basis of national scarcity, this status was removed in 2023 in view of national data collected 2000-19. This account is the March 2022 version and has not been updated since.

Rarity / scarcity status

Poa infirma was a grass of the Channel Islands, rare on the mainland in Cornwall, which in the 1990s apparently began a remarkable expansion along the south coast of England, reaching Kent by 1999. (There is also an alternative explanation that the increase in records is due to an expansion of botanical expectations and recognition.) Its threat status for conservation purposes is one of 'Least Concern', both in England and in Great Britain as a whole. The definition of a nationally scarce species is that it is recorded in 16 to 100 hectads (10km ordnance survey map squares). Since 2000 up till 2021, however, it has been recorded in 267 hectads in the British Isles, so the species' current status as nationally scarce is out of date. It is now neither rare nor scarce in Kent. Its inclusion in the rare plant register is a product of its nationally scarce status, which will doubtless change. Accordingly, the significance of this account is as regards how quickly the recognised distribution of a plant can be fundamentally transformed; there is no particular conservation value attached to this species in Kent.

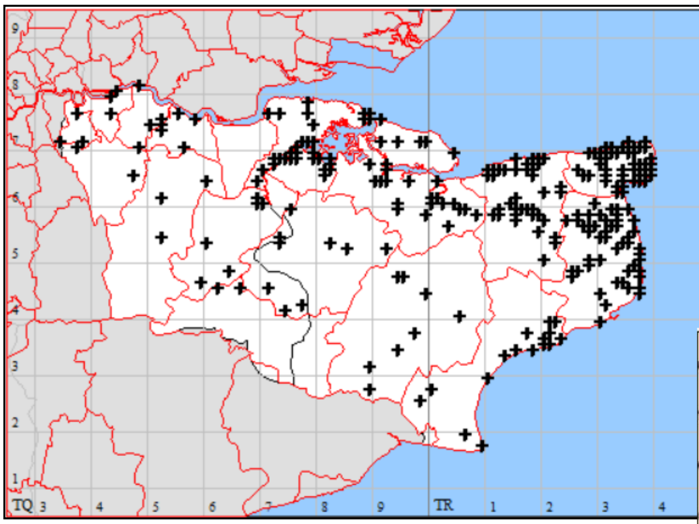
Boughton. Photo by Lliam Rooney, 7 May 2011

Account

The first find in Kent, according to Philp (2010) was on the Isle of Grain in 1999 and by the end of the survey period for that work (1991-2005) it had been found in 23 tetrads, spread along the north Kent coast with one roadside site well inland. Between 2005 and 2010 there appear to have been no records, and it was with the formation of the Kent Botanical Recording Group in 2010 that interest picked up again. The unfolding position was reported in the annual Kent Botany report until the number of records was such that the grass was a regular part of the county flora.

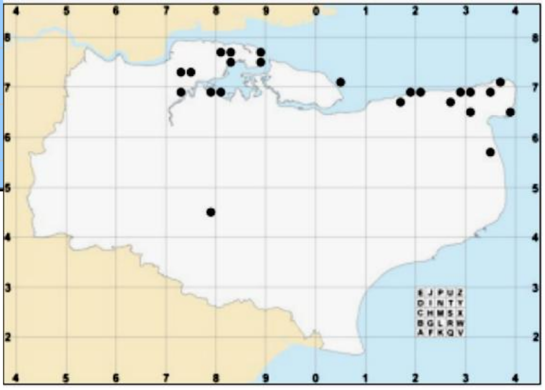
Whitstable. Photo by Lliam Rooney, 8 April 2011

Kent Botany 2010 reported 37 records for that year, covering 19 monads; new locations were already being picked up south of Sheppey. Kent Botany 2011 credited this species with more records for 2010-11 (68) than any other rare plant register species. In Kent Botany 2012, the beginnings of a metropolitan West Kent distribution were reported, plants were found increasingly inland, and it was found in flower beyond the usual February to mid-April period, lasting until mid-May or later. Kent Botany 2013 reported the total number of records for 2010-13 to be 152 and the species was showing signs of all year round flowering, as with *Poa annua* (Annual Meadow-grass). The favoured habitats remained pavements, roadsides and car parks – there seems a strong possibility that much spread is by seed on vehicle tyres. It was surmised that in bare soil areas, such as its discovery as the dominant species on the bare soil under trees in an orchard, there may be a relationship with the herbicide regime, providing a window for establishment and spread through the absence of competition. This could also be relevant to many urban sites by road kerbs or street furniture and under street or park trees.



Poa infirma (Early Meadow-grass) 2010-21

Poa infirma (Early Meadow-grass) 1991-2005



Our records for 2010-21 cover 185 tetrads (equivalent to 243 monads), eight times the extent recorded up to 2005. It now a commoner plant than, say, *Impatiens glandulifera* (Indian Balsam). The comparison with an alien invader is deliberate because, although *Poa infirma* is regarded as a native, albeit at the edge of its range as a Mediterranean species, it appears to be behaving in a way comparable with invading species such as *Conyza sumatrensis* (Guernsey Fleabane) and *Senecio inaequidens* (Narrow-leaved Ragwort). Why it should do that is not apparent, although as discoveries on the British mainland were beginning to emerge in the 1990s it became clear that the species had been to a degree overlooked by botanists, not just because they were not expecting to see it (and it can be small and resemble *Poa annua*), but also because it was capable of flowering in January and February when botanical activity is likely to be low[991]. The recording pattern must in some degree reflect this. The absence of Kent records from 2005 to 2010 was presumably because no-one was looking. Records for the year 2010 reflect one recorder's interest; the subsequent influx of records follows the inclusion of the species on a widely circulated list of rare plant register species.

Upper Harbledown, habitat. Photo by Lliam Rooney, 27 March 2013

However, the impression is still that there is an expansion of range taking place in Kent, and this is reinforced by the almost complete absence of sightings in 'natural' environments: it is almost always in artificial habitats, in places where there is much coming and going, with opportunities for transfer of seeds. While we have a coastal cliff top record and one from sand at the base of cliffs, more usual records include street pavements, especially where they meet a wall base; surfaced and unsurfaced car parks; roadside kerbs, gutters or banks; driveways; grass verges in residential areas; lay-bys; vehicular entrances; bare ground under park trees; track margins; around street furniture and street trees; front gardens near pavements; on railway track at a station; and footpaths (especially to/from car parks). Tellingly, even some very rural locations have an association with vehicles: the grass was present by a quiet country lane, but it was where a vehicle parked; and a find in the corner of a farm field was accompanied by a sighting of the farmer driving his Land Rover round the edge of the field. The evidence seems strong that the grass spreads primarily by vehicles, but also on footwear. While the species' spread is echoed elsewhere in the south of the British Isles, it appears to be more extensive in Kent than in other counties.

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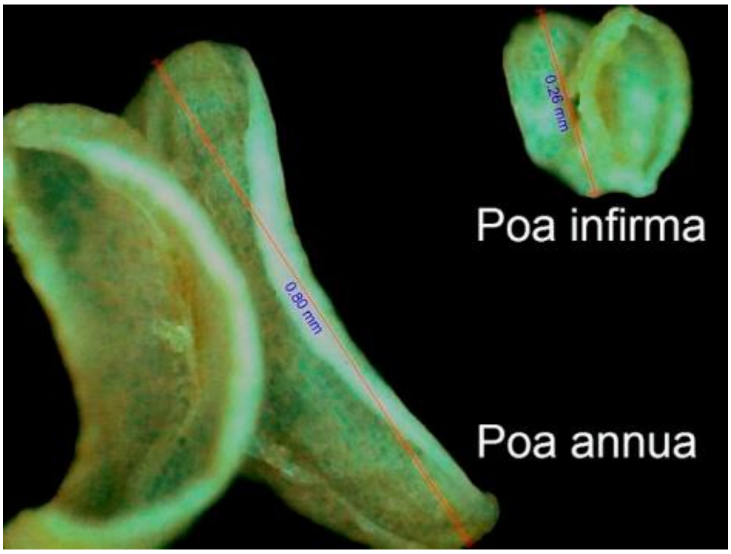
[991] Takagi-Arigho, R. (1994). *Poa infirma* – flourishing?.... or fleeing? *BSBI News* **65**: 14-18.

There is a parallel with *Polypogon viridis* (Water Bent), another grass (albeit introduced) with no records in Philp (1982), just 13 in Philp (2010) and 235 tetrad records for the period 2010-21, an increase of 1,708%. Despite a degree of resemblance to *Agrostis stolonifera* (Creeping Bent) it is not as readily capable of being overlooked for that species than is *Poa infirma* for *Poa annua*, and it is not necessary to postulate that it was there all the time before botanists started taking an interest in it. The dramatic spread of two Mediterranean species at the same time is suggestive of a common cause, perhaps related to climate, whether coastal or urban.

Poa infirma is an annual grass, quite similar to *Poa annua*, which is thought to have originated from a cross between *Poa infirma* and *Poa supina* (a plant of the mountains of northern and central Europe), and so would have related genetic content. *Poa infirma* is generally yellowish-green, which is not normally a colour assumed by *Poa annua* unless affected by herbicide. It has a weaker (or infirm!) appearance, particular when shedding seed and the more distant nature of the florets becomes apparent. However, the anthers are diagnostic: 0.6-0.8 (1.0)mm long and at least twice as long as wide in *Poa annua*; 0.2-.0.5mm long and scarcely as long as wide in *Poa infirma*.



From Boughton, anthers. Photo by Lliam Rooney, 2 May 2013

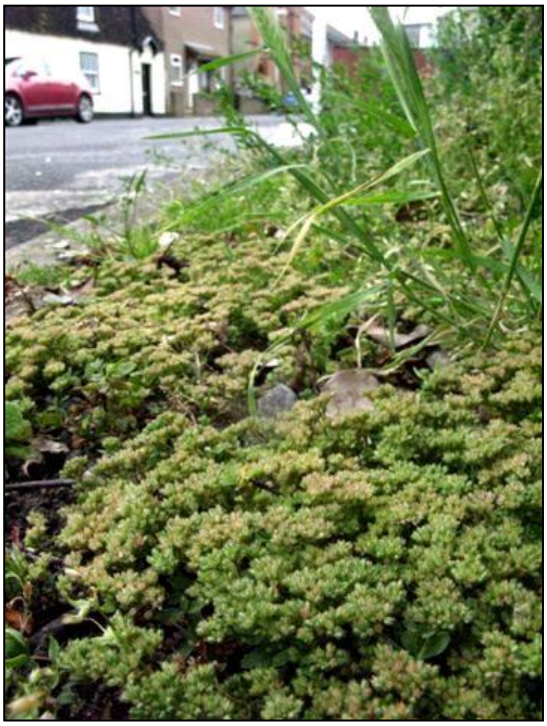
Polycarpon tetraphyllum (L.) L. (Four-leaved Allseed)

vc15 and16

Polycarpon tetraphyllum was on the rare plant register 2013-23. It was removed because, although it was originally included on the basis of national rarity, this status should be assessed on the basis of native records. The publication in 2023 of Plant Atlas 2020 categorised all Kent records as alien. Accordingly, the species was removed from the register in 2023. This account is the March 2022 version with an adjusted introductory paragraph. It is continuing to spread.

Rarity / scarcity status

Four-leaved Allseed is a tiny annual of bare coastal ground, known from the Channel Islands, the Isles of Scilly and scattered on the south west mainland. Records elsewhere are said to be casual, but in very recent years there has been a significant expansion along the south coast, particularly in Kent where it is now on the north coast as well, and into the urban environment of Greater London: these occurrences seem more than casual. Its threat status for conservation purposes is one of 'Least Concern', both in Great Britain as a whole and in England. It has been treated as **nationally rare**, which would mean a presence in not more than 15 hectads (10km ordnance survey map squares). Since 2000 and by 2019, however, it has been recorded in 118 hectads in the British Isles, so national rarity/scarcity status can only be retained for 'native' occurrences, which would exclude those in Kent, according to the categorisation given in Plant Atlas 2020. Following discovery in Kent in 2012, the plant was added to the rare plant register in 2013. It is already sufficiently frequent to be neither rare nor scarce in the county and once the national position is recognised, it will not warrant register status.



Lydd. Photo by Sue Buckingham, 9 August 2012

Account

The first record[992] of *Polycarpon tetraphyllum* in Kent is given in the BSBI database as by Nick Bertrand on 28 August 2011 at Deptford, TQ3777. In metropolitan north west Kent, this is about as far away in the county as one can get from Lydd, in the south east. But the latter location was where the second record was made, on 8 August 2012, by Tim Inskipp (published in Kent Botany 2012 as the first record, in the absence of knowledge of its Deptford discovery). It was present as a street weed at the junction of New Street, Ness Road and Church Road, in Lydd, TR 04392 20988. Plants then continued for 100 metres along Eastern Road to TR 04493 21056 and 50 metres south-westward along New Street. There was no obvious source of introduction, but it had then recently appeared on the Sussex coast (Eastbourne, 2009; Hove, 2011) as well as the Essex side of the Dartford Crossing (2012), so it was not unexpected that it had also arrived in Kent. However, it appeared that the species had been present earlier in the county, but overlooked by botanists. In 2015, Sue Poyser and Doug Grant found it growing between block pavers at Chatham Maritime, some plants being by an old boat containing a flower display. The gardener of that display said she had known it there for at least seven years.

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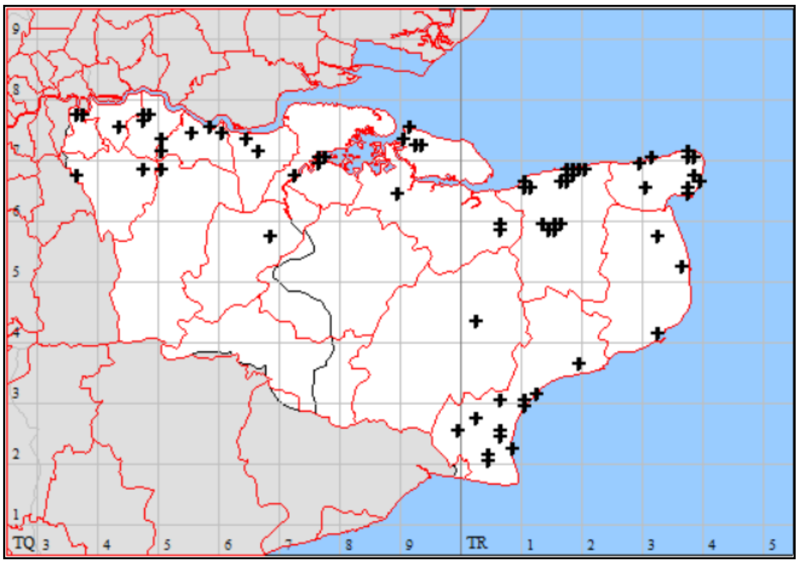
[992] There is some discussion in David Pearman's *The Discovery of the Native Flora of Britain & Ireland* as regards whether Thomas Johnson's 1633 edition of Gerard's *Herball* is referring to *Polycarpon* at Sheppey and Margate, and he concludes that it seems unlikely. Further examination of Johnson's text would indicate that he was actually referring to *Honckenya,* not *Polycarpon*.

In 2013, finds were made at Sheerness High Street and at Dover. By 2015, it was well established at Thanet, seen on brick drives, kerbsides and pavements at Cliftonville, on or by garden walls and pavements at Birchington and on pavements, block-paved drives and a street gutter at Ramsgate. The last site was near where foreign students, mostly Spanish, are regularly dropped off and picked up in their parents' vehicles, which at least suggests the possibility of direct introduction from the Continent by car tyres, although alternative origins including spread by car from other south coast sites have to be considered as well. By 2016, *Polycarpon tetraphyllum* was beginning to be found inland, with sightings on a weedy bank by an Ashford car park and on a block-paved drive and pavements at Canterbury. That year it was first found in West Kent, as a metropolitan street weed, at New Cross in the course of a London Natural History Society meeting, reported by Rodney Burton, who also found it on crazy paving at Bexleyheath and between forecourt paving blocks at Eltham. Another 2016 West Kent record was Daphne Mills' discovery of it in block paving and a road gutter at West Malling.



Polycarpon tetraphyllum (Four-leaved Allseed) 2012-21

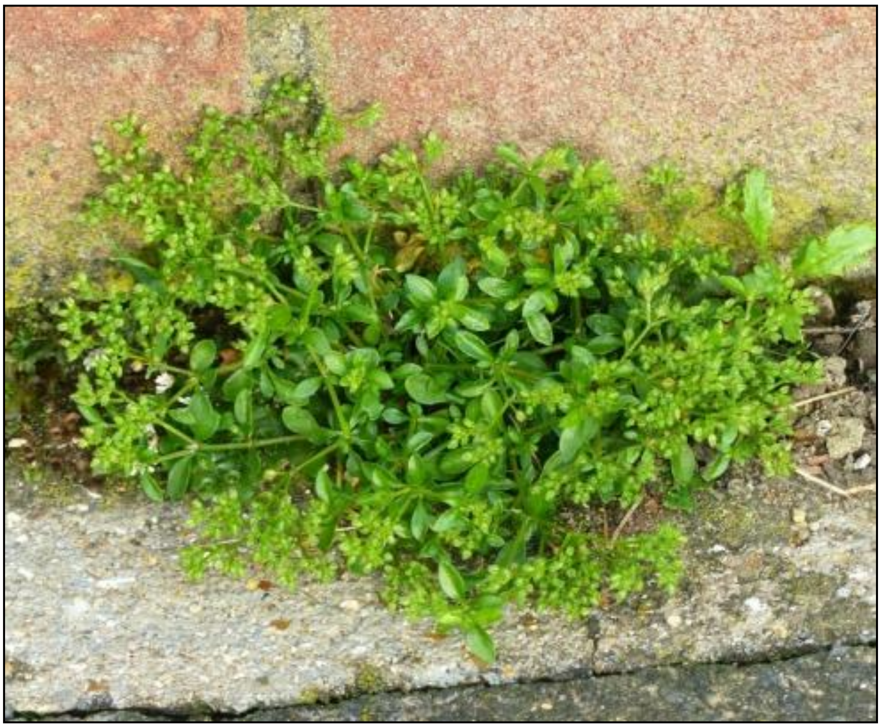
Our 2012-21 records are shown on the accompanying distribution map, data for this register being maintained at 1km (monad) level. In eleven seasons, the plant has shown impressive spread, reaching 53 tetrads, i.e. 72 monads, 2010-21. At present the distribution is primarily coastal, especially in built-up areas; but it has also shown potential as an urban weed in metropolitan West Kent and in Canterbury. It is a Mediterranean species, with Britain at the edge of its range, so that there may be climatic reasons for the initial spread being coastal and urban. This spread is very similar to that of *Poa infirma* (Early Meadow-grass), which had 13 years' start, and it may be that it will develop in a similar way, with inland sites following distribution by vehicles.

Lydd. Photo by Lliam Rooney, 16 July 2015

The manner in which we have become aware of *Polycarpon tetraphyllum* spreading in Britain seems to suggest that it has come from the south west, where it is native. But because it was extremely rare in Cornwall before expansion, it is quite possible any origin from there has been supplemented or superseded by direct introduction, whether by vehicles from the Continent (which may be suggested by the present density of records in Kent in comparison with other southern coastal counties) or (and this is particularly relevant to urban records) through the horticultural trade importing containers of Mediterranean plants, such as olives, figs and palms[993].

We have virtually no records from any 'natural' habitats, although even in its core British native area, the Isles of Scilly, it is now mostly associated with man-made habitats. Almost all our records relate to street pavements and gutters, and to block-paved drives, forecourts and car parks. These supply warm, open habitats with limited competition and often have access to a sandy substrate in which paving-stones or paviors may have been bedded. It is a similar habitat to that which *Laphangium luteoalbum* (Jersey Cudweed) has adopted as an urban weed. As with that species, while *Polycarpon tetraphyllum* behaves as an urban weed, there is little, if any, value for conservation purposes in including it in the rare plant register.

Because *Polycarpon tetraphyllum* is very small and its most conspicuous aspect may be its clustered flowers, there is a passing similarity to *Linum radiola* (Allseed). The latter, however, frequents damp acid forestry tracks, so there should be no confusion between the two, their habitats being so different.



West Heath. Photo by Mike Robinson, 1 November 2017

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[993] *Polycarpon tetraphyllum* was shown to be a frequent constituent of plant containers from Spain and Italy by Hoste, I., Verloove, F., Nagels, C., Andriessen, L. & Lambinon, J. (2009) De adventievenflora van in België ingevoerde mediterrane containerplanten. *Dumorteria* **97**: 1-16.

Rhinanthus angustifolius C.C. Gmel. (Greater Yellow-rattle)

vc16

Rhinanthus angustifolius was on the rare plant register 2013-23. It was removed because, although it was originally included on the basis of national rarity, this status no longer applies. It is in any event a relatively recently introduced species in Kent. Accordingly, the species was removed from the register in 2023. This account is the March 2022 version with an adjusted introductory paragraph.

Rarity / scarcity status

Rhinanthus angustifolius was formerly a widespread weed of arable land in east Britain (being considered an archaeophyte or ancient introduction, although now classed as a neophyte), but this distribution shrank to a very local presence in Surrey, Lincolnshire and Angus. As a result, it was regarded as nationally rare (but is no longer, 2022) and is **protected** from picking and sale under Schedule 8 of the Wildlife and Countryside Act 1981, although its threat status, both in England and Great Britain as a whole, is one of 'Least Concern'. It is not part of the traditional Kent flora but appears to have arrived as an accidental introduction and has been spreading in north west Kent, where it now verges on scarce, but is becoming more frequent.

High Elms. Photo by Geoffrey Kitchener, 24 June 2012

Account

The first account of *Rhinanthus angustifolius* in Kent is by Joyce Pitt[994]. She refers to its occurrence in Surrey, where it has been well known on the chalk downs at Happy Valley Coulsdon and at Chipstead since the 1960s. The City of London manages commons such as Coulsdon Common and Farthing Downs where the species grows and Spring Park Woods, West Wickham (which are bisected by the vc16/17 boundary) where it did not; but in 1992 the management of the grassland area at Spring Park was changed in favour of an annual hay cut. It appears that *Rhinanthus angustifolius* seed was accidentally introduced on the hay cutting machinery from Surrey sites. After this, the species starting turning up on other sites where hay cutting is carried out by local authorities and presumably has the same cause.[995]

In 2010 Orpington Field Club found it in an isolated area of grassland near Burwood School, Avalon Road, Orpingon (TQ4765), cut for hay by the local authority. In 2012 it was recorded at Jubilee Country Park (TQ4367); also in High Elms Country Park (TQ4462, probably here at least since 2009); and Keston Common (TQ4164). In 2013 it was at Elmfield Meadow, Bromley Common (TQ4167) and at Tubbenden Meadow, Darrick Common/Newstead Wood Park (TQ4464). In 2014 it was seen at Lullingstone Park (TQ5164; also in TQ5264 in 2015); in 2015 it had extended further in Jubilee Park, reaching TQ4467; and in 2017 it was recorded in Glentrammon recreation ground (TQ4563 and TQ4663). Virtually all these sites are managed by Bromley Council and probably share in common their contractual mowing arrangements. One anomalous site, however, is the nature reserve at Saltbox Hill, Biggin Hill (TQ4061) where it was seen in 2011 on the steep grassland slope of a dry chalk valley. This was grazed (under management by London Wildlife Trust) rather than cut, so that although the species is likely to have been introduced, given that it did not show up on earlier plant surveys, it will not have arrived on mowing machinery. More likely is introduction via grazing stock or from naturalists visiting both this butterfly-rich site and the similar Surrey *Rhinanthus angustifolius* sites. By 2020 it was abundant across the site, extending also into TQ4060, with drifts of this species and *Rhinanthus minor* (Yellow-rattle), often growing intermingled.

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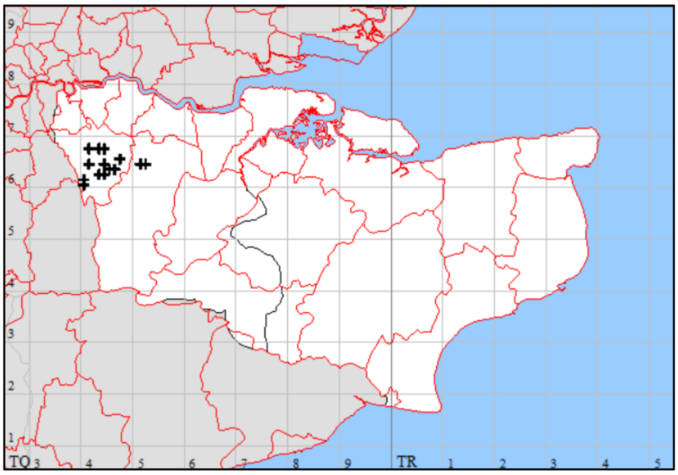
[994] Pitt, J. (2010). Fifty years of botanical records. In *Orpington Field Club 50 years on*... pp.23-33.

[995] Spread on hay-cutting machinery was demonstrated experimentally in the Netherlands: Strykstra, R.J., Bekker, R.M. & Verweij, G.L. (1996). Establishment of *Rhinanthus angustifolius* in a successional hayfield after seed dispersal by mowing machinery. *Acta botanica neelandica* **45**: 557-562.

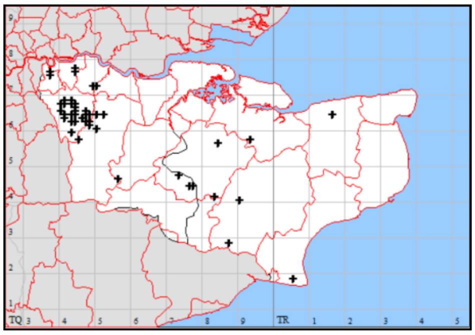


Our 2010-21 records amount to 12 tetrads (14 monads) and are shown on the accompanying map at monad level.

***Rhinanthus angustifolius* (Greater Yellow-rattle) 2010-21**

This distribution is given in comparison with that of *Oenanthe pimpinelloides* (Corky-fruited Water-dropwort) because, although the latter has some native sites scattered across the county, it has also undergone the same sort of expansion as *Rhinanthus angustifolius*, over the same period, in north west Kent. It, too, is presumably a mower-spread plant.

***Oenanthe pimpinelloides* (Corky-fruited Water-dropwort) 2010-21**



High Elms. Photo by Geoffrey Kitchener, 24 June 2012

Rhinanthus angustifolius is a hemiparasite, attaching to the roots of various grasses and herbs to support its requirements for water and nutrients. It can grow without a host, or with other *Rhinanthus angustifolius* plants, but then is not so successful. Its growth characteristics are capable of being affected by the host species, Swedish experiments having shown that growth on *Trifolium pratense* (Red Clover) resulted in the tallest, thickest stems, the longest internodes, the longest racemes and highest total flower production, but also delayed and extended flowering; plants grown on *Poa pratensis* (Smooth Meadow-grass) were relatively small with shorter flowering periods than those grown on other grasses; and growth on *Lolium perenne* (Perennial Rye-grass) and *Festuca rubra* (Red Fescue) produced plants with characteristics intermediate between those of plants hosted by *Trifolium* and *Poa.*[996] It is an annual, whose seed has only short term viability, generally not more than a year. Accordingly it is vulnerable to population fluctuations, since spring drought may reduce seed production without an ability to recruit from a persistent seed-bank.[997]

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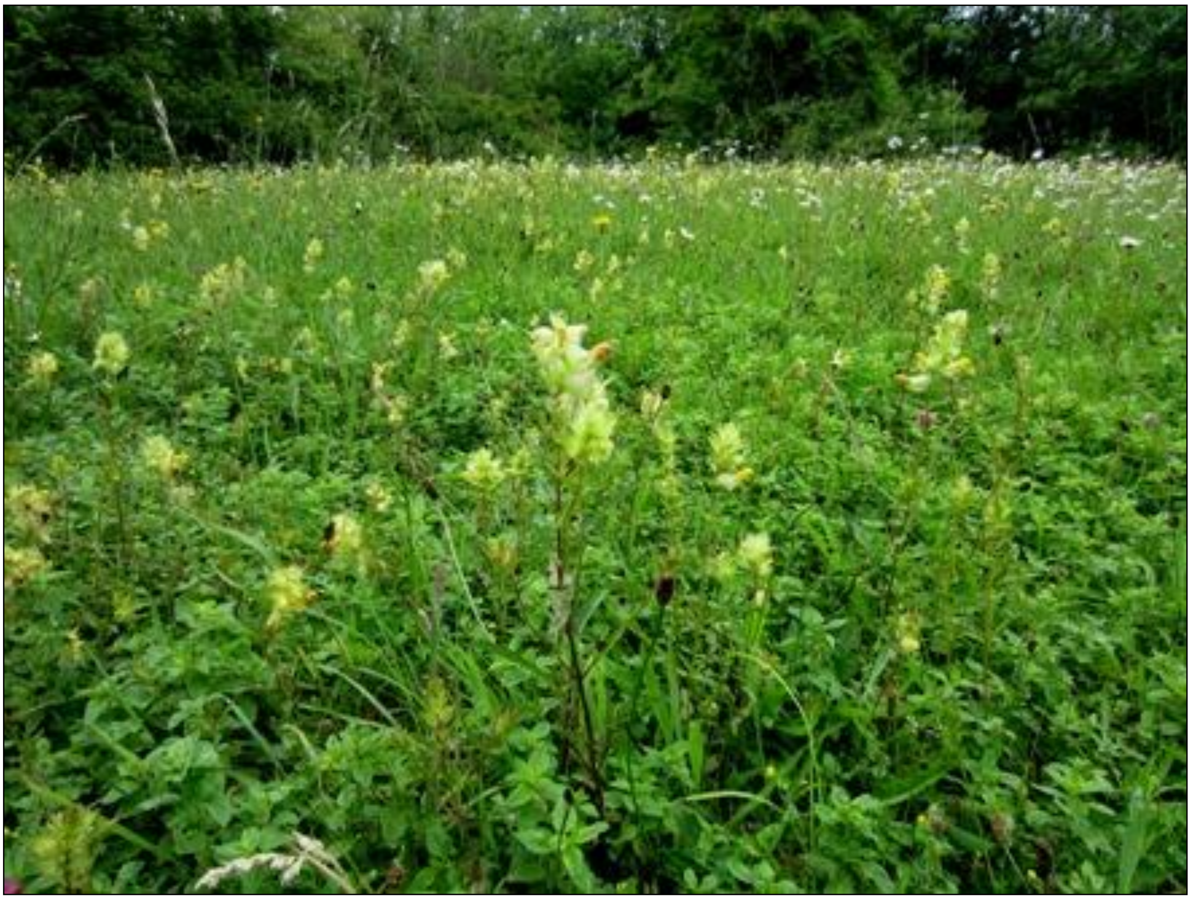
[996] Jonstrup, A., Hedrén, M. & Andersson, S. (2015). Host environment and local genetic adaptation determine phenotype in parasitic *Rhinanthus angustifolius*. *Botanical Journal of the Linnean Society* **180**: 89-103.

Rhinanthus angustifolius differs from the commoner *Rhinanthus minor* (Yellow-rattle) in generally being more robust and branched, with the purple teeth on the upper lip of the corolla being over 1mm long , longer than wide, and the corolla tube curved upwards.



High Elms. Photo by Geoffrey Kitchener, 24 June 2012

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[997] Ameloot, E., Verheyen, K., Bakker, J.P., De Vries, Y. & Hermy, M. (2006). Long-term dynamics of the hemiparasite *Rhinanthus angustifolius* and its relationship with vegetation structure. *Journal of Vegetation Science* **17**: 637-646.

Kent Rare Plant Register: Appendix B
‘Probably extinct’ Kent plants

Limonium humile **collected by J.T.B. Syme at Whitstable, 1869.**

Cuscuta europaea **collected by R.L. Baker at Folkestone, 1873**

Reproduced from Herbaria@Home, specimen in University of Birmingham Herbarium

Compiled by Geoffrey Kitchener
Issue date: May 2025

This is a list of plants which would have been in the Kent rare plant register[998] if still present in the county (vice counties 15 and 16), together with others treated as doubtful. They are listed under three headings:

Part 1: those which have not been seen in the wild in the county since 1970, in consequence of which it is reasonable to assume that they will not be seen again. They might be regarded as locally ‘extinct’, although this is a term which has attracted some critical comment.

Part 2: those for which record has been traced since 1970, and which could be locally ‘extinct’ but which may still persist or may be capable of reappearing, and for which there is therefore potential for rediscovery.

Part 3: those where there is enough doubt as regards their original identification, location or native status that it would not have been reasonable to include them in the rare plant register in any event. It is proposed, where there is some uncertainty about native status, to operate on the presumption that it is better to include the taxon in the register, so as to encourage gathering data which may help define the extent of uncertainty.

Details are given, where practicable, for the last record which has been identified. Some of these last records were in places where the plant had not been previously recorded and so might be suspect, but are incapable of verification now if specimens were not retained.

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[998] The rare plant register focuses on plants which are considered to be native to Kent but does not discount those which are native elsewhere and have reached Kent by ‘natural’ means. Nor does it discount ancient introductions which are regarded as having the status of archaeophytes, so all references to “native” plants are to be regarded as including archaeophytes. An archaeophyte is a plant which was introduced by man (or arrived naturally from an area in which it was present as an introduction) and became naturalised before AD 1500.

Part 1
'Extinct' native taxa
(not seen in the wild since 1970)

Achillea maritima (= *Otanthus maritimus,* Cottonweed): before 1778. It is no longer found in Britain.

Aegonychon purpureocaeruleum (*Lithospermum purpureo-caeruleum*) (Purple Gromwell): 1871 as a (probable) native, from Darenth Wood, near the middle of the wood, c. 150yds left of Dartford-Stone public path, flowering only second year after coppicing; a 1910 record from Bearsted was considered by Francis Rose to be an escape.

Alchemilla glabra (Smooth Lady's-mantle): 1951, R.A. Graham at alluvial meadow, Birling Marshes, TQ6960.

Arnoseris minima (Lamb's Succory): 1845, Fletcher at Bexley Heath; probably extinct in the British Isles.

Atriplex pedunculata (Pedunculate Sea-purslane): 1924, E. Graham at Pegwell Bay, TR 346 638 (or perhaps 1930, A.J. Wilmott at Ebbsfleet, Pegwell Bay, according to Francis Rose).

Asplenium marinum (Sea Spleenwort): before 1899 at Dover, record from the Rev. C.H. Fielding accepted by Hanbury & Marshall (1899) with hesitation.

Asplenium obovatum (Lanceolate Spleenwort): 1859, Tunbridge Wells; extinct there at least by c.1885.

Botrychium lunaria (Moonwort): In West Kent, 1960, F.R. Browning at Bedgebury Pinetum. In East Kent, 1947, F. Rose at the top of Detling Hill, in pasture on the east side of the A249 behind a low flint wall, TQ804587. The frontage may have been affected by A249 dualling and the site appears to have been developed in the 1990s; adjoining land is bramble-dominated.

Bromus interruptus (Interrupted Brome): 1942, W. Howell at Kelsey Park, Beckenham, TQ3769; considered extinct in the wild in the UK. Sown deliberately at Ranscombe Farm, 2015, and since established.

Bupleurum rotundifolium (Thorow-wax): East Kent, 1950 or later, TQ94 in BSBI database; West Kent, 1906 L.C.C. Botany Dept at Eynsford, although the species almost certainly persisted longer in the latter area; and a casual was seen, probably from a wild flower seed mix, at Grosvenor & Hilbert Parks, Tunbridge Wells in 2015; also escapes from cultivation in arable near Patrixbourne in 2016, onto an Eynsford pavement in 2018 and on a spoil heap at Oare, 2019.

Calamagrostis canescens (Purple Small-reed): 1967, R. English at TQ 930 305, north of Chapel Bank.

Campanula patula (Spreading Bellflower): before 1899; the last dated record appears to have been published in 1821, a specimen having been known from Cobham Park dated 1815.

Carex depauperata (Starved Wood-sedge): 1830, Charlton Wood, at the back of Charlton Church, since built over. The Species Recovery Trust (2025) has proposed its 'reintroduction'.

Carex diandra (Lesser Tussock-sedge): East Kent, 1968, R.M. Burton and other LNHS members at Dungeness, between old coastguard cottages and main Open Pits; loss probably due to falling water levels and growth of *Salix cinerea*. A more recent claimed West Kent occurrence is unconfirmed and unlikely.

Carex viridula Small-fruited Yellow-sedge): 1947, Dungeness; mentioned in Philp (2010) which states that other records are in error (notwithstanding that A.M. Massee in the December 1964 *Entomologist's Monthly Magazine* wrote as though it were currently present on the bare shingle shore of the north-east side of Open Pit 3). However, in the Oxford herbarium of Dillenius (d. 1747) is a specimen from Shooters Hill det. by C.G. Druce as *C. oederi* Retz., probably with the intention of referring to what is currently *C. demissa*; but (*fide* D. Pearman) this is true *C. oederi (*now *C. viridula)*.

Cephalanthera rubra (Red Helleborine): 1919, vouched for by T.W. Attenborough near Wye (there have been subsequent reports but not of sufficient authority; nor has there been Kent-collected material at any time).

Colchicum autumnale (Meadow Saffron): as a probable native, seen in 1825 (moist field between Shooter's Hill and Plumstead Common, J.T. Cooper) and probably extinct by 1899; subsequent casual records (e.g. 3 plants on New Hythe Marshes, 1931 – *Rochester Naturalist* 132 (1932) p. 137) are taken to be non-native.

Cuscuta europaea (Greater Dodder): W Kent, 1902 (Lord Justice James Stirling near Combwell); E. Kent, 1873 (R.L. Baker at Folkestone).

Cynoglossum germanicum (Green Hound's-tongue): 1930, F .Forsyth, in a shaw south of Crookham Wood Snodland (unconfirmed); abundant presence near Trottiscliffe / Ryarsh is from a deliberate 1958 introduction by F. Rose, and it has spread c. 1km away from original introduction site; presence at Halstead (2016-22) is a garden escape.

Damasonium alisma (Starfruit): W. Kent, c.1890 (Tucker's Pond, Angley Wood, Dr. Ranger); E. Kent, 1802 (between Sandgate and Folkestone, Dillwyn; lost by 1829).

Dryopteris cristata (Crested Buckler-fern): 1962, F. Rose, Dungeness, almost certainly pit no. 6 in TR0618, where it had been known in the 1950s.

Echinophora spinosa: disappeared before 1777, and has been long excluded from British Floras as extinct in the British Isles.

Elatine hexandra (Six-stamened Waterwort): 1948, F. Rose at Marshall's Lake, Bedgebury, TQ7233.

Eriophorum latifolium (Broad-leaved Cottongrass): either 1847 (Harringe near Sellindge, Mrs Robinson) or (date unknown) before 1899 (W.R, Jeffrey at Willesborough Lees – although this record was doubted by Francis Rose).

Eriophorum vaginatum (Hare's-tail Cottongrass): before 1884, as a native (Tunbridge Wells, probably Fisher's Castle).

Erodium aethiopicum (*E. lebelii*) (Sticky Stork's-bill): E Kent 1955 (P.H. Morgan at Sandwich, TR355 573); W Kent -a casual on soil banks at Green Street Green Common, TQ5770, was reported by J.R. Palmer for 22/06/2004 ('fls. ≯5mm across; lvs, stems, sepals, pedicels a mass of glandular hairs, sticky').

Erophila majuscula (Hairy Whitlowgrass): 1924, D.G. Catchside at Keston Common. Records in 2018 reported for two W Kent sites were withdrawn.

Euphorbia peplis (Purple Spurge): 1900, J. Roffey between Deal and Sandwich, perhaps St George's golf links; probably extinct in the British Isles.

Filago lutescens (Red-tipped Cudweed): E Kent 1963 (E.G. Philp near railway bridge at Tutt Hill north of Hothfield, TQ 973 468 - M20 since constructed here). W Kent: known at western edge of Farningham Wood until 1959.

Gagea lutea (Yellow Star-of-Bethleham): 1898, although poor status – L. Kitching, running wild in garden at Bockhill, TR3745.

Galeopsis segetum (Downy Hemp-nettle): 1836, Daniel Cooper at Darenth Wood; probably extinct in the British Isles.

Genista pilosa (Hairy Greenweed): 1831, G.E. Smith, south of road from Wrotham Heath to Ightham, uphill towards mill (cf. road called Windmill Hill).

Gentiana pneumonanthe (Marsh Gentian): 1896, Sir James.Stirling at Goudhurst (actually Combwell Wood, Bedgebury).

Hammarbya paludosa (Bog Orchid): before 1899, probably after 1891, at Friezley Bog, Cranbrook.

Hordelymus europaeus (Wood Barley): 1956, F. Rose in beechwood east of the road at Riverhill, Sevenoaks, TQ5451 or TQ5452.

Hymenophyllum tunbrigense (Tunbridge Filmy-fern): before 1899, from Penshurst (?on the sandrocks at Redleaf) and Tunbridge Wells. The latter site was probably at Hungershall Rocks, within a few hundred yards from High Rocks, but in vc 16 (which they are not). Material from Eridge Rocks was transplanted there by Clive Stace – C.A. Stace (1962) Transplantation experiments: Hymenophyllum, *Kent Field Club Bulletin* 7: 16-17). Not seen at Hungershall Rocks when surveyed 2016, but probable location identifiable. Any surviving transplants may well have been removed in any event, as appears to have been the intention, cf. *British Fern Gazette* (1962) 9: 84.

Isatis tinctoria (Woad): before 1899.

Juncus foliosus (Leafy Rush): 1890, TR15.

Limonium humile (Lax-flowered Sea-lavender): 1869 (Whitstable, J.T.B. Syme); Philp (2010) reserved the position regarding its occurrence at all.

Liparis loeselii (Fen Orchid): 1802, L.W. Dillwyn at Ham Ponds.

Littorella uniflora (Shoreweed): 1950, F. Rose at St Leonard's Lake TQ65. It was also present at Dungeness in 1947 (Philp, 2010), but A.M. Massee in the December 1964 *Entomologist's Monthly Magazine* wrote as though it were currently present on the bare shingle shore of the north-east side of Open Pit 3.

Logfia gallica (*Filago gallica*) (Narrow-leaved Cudweed): Claimed by F. Forsyth for c. 1946 on Lower Greensand between Snodland and Borough Green; otherwise 1840s (?), E. Edwards at side of Darenth Wood.

Lycopodiella inundata (Marsh Clubmoss): W Kent, 1930 (S.E. Chandler at Keston Bog); E Kent, 1931? (recorded but unconfirmed at Hothfield, there were attempted introductions here in the 1940s as well)..

Orchis militaris (Military Orchid): 1881 - there are 19th century specimens at least one of which, from Cobham in 1836, was accepted by Francis Rose, but not by Philp (2010), who considered that those which he had seen were *O. purpurea* or cultivated. However, there are further specimens determined on good authority, including one collected by De Crespigny in 1881 from Maidstone and a pre-1747 specimen from the collection of Dillenius identified by G.C. Druce; also two specimens from Wye (one 1873, the other undated, but may be as late as 1923) accepted as *O. militaris* by D. Lang, P. Gay and, in one case, J.E. Lousley. The position is complicated by DNA studies of *O. purpurea* indicating that the species may cover two genetic entities, one with some DNA characteristics normally associated with *O. militaris*; but there is now plenty of authority for acceptance of *O. militaris* as formerly a Kent plant.

Oxybasis urbica (*Chenopodium urbicum*) (Upright Goosefoot): before 1930.

Pedicularis palustris (Marsh Lousewort): 1954 (dike between Hacklinge and Worth Minnis, not seen after this was dug out and widened in 1956).

Petrorhagia nanteuilii (Childing Pink): E Kent, 1960, (at Hythe – probably roadside south of the ranges canteen, TR13 – and at Richborough, on waste ground by railway sidings); W Kent, 1882 (sandy railway bank at Malling).

Phyteuma orbiculare (Round-headed Rampion): E Kent, 1913 (L. Day at Kingsdown); W Kent, 1877 (E. de Crespigny at N. Downs near Sevenoaks, probably Moraunts Court Hill).

Pseudorchis albida (Small-white Orchid): 1877, Dr Bailey near Chatham (this record, from C.H. Fielding, may be suspect).

Pulicaria vulgaris (Small Fleabane): 1877 (Lewisham, by the Ravensbourne, E. de Crespigny).

Rosa sherardii (Sherard's Downy-rose): before 1950.

Sagina subulata (Heath Pearlwort): 1957, G.H. Morgan and E.G. Philp at Aylesford sand pits.

Schoenoplectus triqueter (Triangular Club-rush): perhaps 1938, but recent records appear to have been in respect of the hybrid with *S. lacustris*.

Scilla autumnalis (Autumn Squill): 1920, Miss Bacon, at Blackheath.

Stachys germanica (Downy Woundwort): 1933, H. Elgar at Pilgrims Road between Lower Bell and Boarley, Maidstone.

Thesium humifusum (Bastard-toadflax): 1963, C.A. Stace on roadside bank at Chartham Downs (gone by 1978 due to close mowing).

Tilia platyphyllos (Large-leaved Lime): pre-historic; historic records are taken to be introductions.

Trichophorum cespitosum (Deergrass): W Kent 1962 (F. Rose at Keston Bog, 2 clumps; gone by 19690; E Kent 1829 (Willesborough Lees).

Trifolium ochroleucon (Sulphur Clover): 1666, Christopher Merrett, between Northfleet and Gadshill. This record may well be correct, but the same cannot be said of subsequent records.

Turritis glabra (Tower Mustard): 1958, although an assumed non-native occurrence was recorded at Lesnes Abbey ruins, 2018 (following building works which either introduced it or disturbed a seed bank) and recurred each year to 2023.

Utricularia minor (Lesser Bladderwort): a 1966 record from the Royal Military Canal has been rejected by Philp, 2010; however the species was given in Hanbury & Marshall (1899) at locations including Ham Ponds TR35, although doubted by Philp (2010), albeit that either Hanbury or Marshall had personally confirmed it at Ham; and there is a further record from that location by Lady J.C. Davy, 1900.

Valerianella eriocarpa (Hairy-fruited Cornsalad): E. Kent, ?1970 (this is an assigned date for record by C.A.Stace at Dungeness, could have been any time from mid 1950s); W Kent, 1956 (gravel pit west of Brandbridges, TQ 673 482, C.A. Stace). This species was previously regarded as a neophyte, but is now considered a British native at least in Dorset.

Valerianella rimosa (Broad-fruited Cornsalad): 1963.

Viola lactea (Pale Dog-violet): G.E. Shaw, c.1936, Tunbridge Wells.

Part 2

Native taxa, perhaps extinct

(seen in the wild since 1970, but may not persist: potential for rediscovery)

Blysmus compressus (Flat-sedge): E Kent, 1991 (Francis Rose at Ham Fen). Last W Kent record 1988 (J. Pitt at Snodland where site since destroyed); also 1985 by LNHS at Foot's Cray meadows, TQ 479 716 where gone by 1990 with site dry and overrun by *Cirsium arvense*).

Cephalanthera longifolia (Narrow-leaved Helleborine): W Kent, 1989 (J. Pitt at Brasted Chart, TQ 467 535 in beech woodland and scrub behind row of houses, original find location by R.A. Clarke given by him as TQ 466 528 – may have been affected by the clearance operations following the 1987 storm creating disturbance and resulting in more ground flora competition); E Kent, c.1930 (F. Forsyth at Boxley Warren).

Cerastium pumilum (Dwarf Mouse-ear): E Kent, 1977 (J.P. Huntley at Wye, TR 088 479); W Kent, 1972 (Mrs Hewson at Knole Park, TQ55G).

Cirsium dissectum (Meadow Thistle): In E Kent, last recorded on 24 July 1991 by Francis Rose at Ham Fen. In W Kent given in Philp (1982) (between 1971 and 1980) near Bayham Abbey TQ63N (may be a Francis Rose 1979 record west of Ellis Wood, probably a valley site dammed as a lake before 1990). Philp (1982) also mentions Hawkenbury Bog TQ53Y (habitat since changed, but site was in vc 14, East Sussex).

Coeloglossum viride (Frog Orchid): 1998, P. Green at Coombe Hill, Dover, a 1984 record gives TR 301 427 (probably subsequently overgrown).

Drabella muralis (*Draba muralis*): 1986, G. Kitchener, top of ragstone wall bounding former sand quarry, Shoreham Lane, Riverhead, TQ 51595 56180, where it was casual for a couple of years.

Epipactis leptochila (Narrow-lipped Helleborine): August 1972, E.G. Philp at Trenleypark Wood TR15Z; or between 1971 and 1980, near Kingston TR25A or Alkham TR24R.

Galeopsis speciosa (Large-flowered Hemp-nettle): between 1971 and 1980 at Tunbridge Wells TQ53Z or Chiddingstone TQ54D.

Galium tricornutum (Corn Cleavers): 1980, behind sea wall east of Gravesend, TQ67S, probably introduced with spice adventives; long gone as an arable weed in the county.

Lolium temulentum (Darnel): 1974, C.G. Hanson at Stone tip, TQ 565 746 – modern rubbish tips now appear unsuitable; long gone as an arable weed in the county.

Lycopodium clavatum (Stag's-horn Clubmoss): between 1971 and 1980 – seven tetrads were given in Philp (1982); potential for finding where forestry plantations are felled.

Mespilus germanica (Medlar): between 1971 and 1980, at Pluckley TQ94B, Eastling Wood TR34D or Churchfield Wood, TQ5073 – surely this must still be present somewhere, other than obviously planted!

Myriophyllum alterniflorum (Alternate Water-milfoil): W Kent, 1974 (W.E. Coultrup at Ashurst TQ53E); E Kent between 1971 and 1980 (near Brabourne, TR04V.)

Potamogeton alpinus (Red Pondweed): E Kent, 1974 (W.J. Morgan near Woodchurch in pond, TQ 953 367); W Kent, 1865 (marsh ditches, Tonbridge).

Pyrola minor (Common Wintergreen): W Kent, between 1971 and 1980 at (Scords Wood TQ45R, apparently a chert pit which has since become overgrown, SL, 2019; or Sevenoaks near Gracious Lane, TQ 533 586); E Kent, 1911 (East Farleigh).

Ranunculus omiophyllus (Round-leaved Crowfoot): 1938, Hayes: there is a later, 1943, claimed specimen from Furnace Farm, Lamberhurst, but this, although marked vc16, appears likely to have been from East Sussex, vc14, and in any event is *R.* x *novae-forestae*.

Rosa obtusifolia (Round-leaved Dog-rose): W Kent, 1972 (R.A. Clarke at Chafford Bridge, TQ5140); E Kent, 1890 (Ham Street).

Stellaria palustris (Marsh Stitchwort): 1986, R. FitzGerald at Ashford TR 009 406. Photographs suggest this site was a curved watercourse, best searched from TR 0100 4050.

Tephroseris integrifolia subsp. integrifolia (Field Fleawort): mid 1970s at Scarborough Spur, Burham, in an area since scrubbed over and which has become woodland.

Torilis arvensis (Spreading Hedge-parsley): W Kent, between 1971 and 1980 (at West Malling, TQ65Y); E Kent, 1971 (at Minster, TQ9573).

Vicia parviflora (Slender Tare): E Kent,1972 (E.G. Philp at edge of ride in Ellenden Wood, TR16B); W Kent, 1953 (Gilridge, N of Penshurst).

Part 3
Extinct taxa, doubtful as to identification, location or native status

Cystopteris diaphana (Greenish Bladder-fern): recognised as native in Britain in 2005, although already referred to as growing at Tunbridge Wells in Pratt (1871); but as herbarium specimens from the 1850s are marked as from Harrison's Rocks nr Tunbridge Wells, and this location is in East Sussex (vc14) rather than West Kent (vc16), there is insufficient evidence of this having been a Kent plant.

Daphne mezereum (Mezereon): native status queried by Hanbury & Marshall (1899); and Philp (2010) considered this probably always introduced as a garden escape in Kent.

Festuca altissima (Wood Fescue): last record has been given as 1852, but this relates to Harrison's Rocks in vc14; other Kent records in Hanbury & Marshall (1899) are unconfirmed. Francis Rose was of the view that this was probably never found in Kent.

Herniaria glabra (Smooth Rupturewort). 2005, K. Kersey near Detling Hill, TQ85R. This and previous occurrences are taken to be non-native.

Linum perenne subsp*. anglicum* (Perennial Flax): Philp (2010) refers to old records, but the pre-1899 records collated by Hanbury & Marshall (1899) were considered by those authors to be in error for *L. bienne*; probably never a Kent plant. *Linum perenne*, however, was noted as a casual at Crockenhill in 2018 and north of Sutton-at-Hone in 2022.

Melittis melissophyllum (Bastard Balm): 1879, J.E. Little in the Medway Valley, published in the Gardeners' Chronicle, but subsequently disclaimed by Little in correspondence.

Pilularia globulifera (Pillwort): whilst there are records, they do not come with supporting data, and a Sutton Valence report mentioned by Hanbury and Marshall (1899) was apparently accepted by them on the basis that it was unlikely to be confused with anything else; nonetheless, it may be doubted, and Philp (1982, 2010) considers that the species may always have been recorded in error in Kent.

Ranunculus fluitans (River Water-crowfoot): Philp (1982) stated that no definite records had been traced and the preparatory work for this (in *Kent Field Club Bulletin*, 1978) states that the taxon was probably recorded in error; the taxon is disregarded in Philp (2010). This would have been with the clear knowledge that Francis Rose claimed it near Staplehurst at a Kent Field Club meeting on 24 August 1963 and in writing up his report said that it had earlier been found in the Beult at Sherway Bridge, Smarden and in the Medway at Hartlake Bridge.

Rosa mollis (Soft Downy-rose): Philp (1982) refers to a plant at Culverstone Green TQ66G between 1971 and 1980; but native status seems unlikely. See Kent Botany 2011 and 2015 for a discussion of historic and recent potential records at

Kingsdown, resolved in 2015 by identification as *Rosa villosa*, probably long-term naturalised escapes. See Maskew, R. (2017). *Rosa villosa* L. in Kent, new to Britain. *BSBI News* **134**: 36-37.

Scirpoides holoschoenus (Round-headed Club-rush): an introduction at Conyer disused brickworks, 1971-86.

Acknowledgements and references

The compilation of these listings was greatly facilitated by the information published in Philp (1982 and 2010), also the contents of Francis Rose's manuscript *Flora of Kent* and the BSBI database*;* and the compiler is also indebted to the late Eric Philp for answering various queries; as also David Johnson, Joyce Pitt and Stephen Lemon. Views expressed above as to the categorisation of plants are, however, those of the compiler, unless otherwise indicated.

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Kent Rare Plant Register

Appendix C:

How the register was put together

Orobanche caryophyllacea at Sandwich Bay. Photo by Lliam Rooney, June 2010

Compiled by Geoffrey Kitchener and the Kent Botanical Recording Group
Issue date: May 2025

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1. Register documents

This forms part of a suite of documents as follows:

- the full list of species in the Kent rare plant register
- the rare plant register species accounts
- register Appendix A: accounts of plants which were once on the register, but which have been removed
- register Appendix B: ‘probably extinct’ plants which otherwise would have qualified for the register
- this register Appendix C: How the register was put together.

They may be accessed via the Kent webpage of the BSBI website at https://bsbi.org/kent

2. Purpose

Many counties (or botanical vice-counties) now have county rare plant registers, either complete or in preparation. This exercise has been encouraged by the Botanical Society of Britain & Ireland, who have published a number of registers as well as guidelines to encourage consistency of compilation. This register is intended to fill the gap for Kent and, by assembling and publishing data on the presence, location, population trends and perceived threats, it should assist in conservation, monitoring, research and further recording.

3. How the register began and developed

Prior to the initiation of this register, Kent had no such current active register, but a broadly similar function was fulfilled by the vascular plants section of the Kent red data book (Pitt, 2000), which covered 164 plants. Since 2000, there have been developments in how rarity and scarcity are assessed[999], and in the availability of national and local botanical data to inform such assessment[1000]. Accordingly, any register project would need to reflect these developments and, for example, the listing of plants would not be the same.

In early 2010 a proposed list of rare plant register plants (RPR plants) was issued for consultation, together with the criteria for their selection and suggestions as regards the geographic area to be covered. As a result of feedback, changes were made and the register proposal was put to the Kent Botanical Recording Group at its inaugural meeting in March 2010 and adopted. After a year’s recording, the list was again revised, and preparation of individual species accounts began. These accounts were made available on a rolling basis in draft, so as to encourage feedback and further recording; and a cycle of updating was undertaken to keep the register current. The list of RPR plants was updated to meet changes in circumstances and, following request, there was also made available a version with both Latin and English names.

Development took far longer than was expected. It was not until 2023 that the final species account, for *Zostera*, was completed! The time taken partly reflected the time available for the task, but also the standard adopted for the species accounts in providing a full analysis of trends from the first county record onwards, details of research undertaken on Kent plants and populations, information on conservation and rarity designations, tables of records and/or distribution maps, ecological information and photographs (ideally close-up, whole plant and habitat). The lengthy development period, however, had an advantage in that it was possible for the Kent Botanical Recording Group to build up records and supplementary information to understand better the selected species. Although we had good general records for the county through Philp (1982 and 2010), these records were of presence or absence on a tetrad basis without any other details. Finding a plant on the basis of a tetrad grid reference, even knowing its habitat preferences, is often far from straightforward, and although Eric Philp's recall of sightings was extraordinary, we could no longer seek details from him following his death in 2013.

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[999] See Cheffings & Farrell (2005) in conjunction with Leach & Walker (2011).

[1000] At the outset, nationally, in particular through Preston, Pearman & Dines (2002); locally through Philp (2010).

There were two occasions on which significant changes were made to the scope of the register.

The first was the publication of *A Vascular Plant Red List for England* (Stroh *et al*., 2014). This involved a reassessment of the conservation status of our native and archaeophytic flora, so as to enable us to include in the register a number of species which formerly had no special status, but which now were found nationally to be Threatened or Near Threatened. Many of these had been previously supposed to be widespread with relatively stable distributions; but now were found to be in steep and sharp decline. As a result, 49 species were added to the register, including not uncommon (but declining) species such as *Fragaria vesca* (Wild Strawberry).

The second occasion for significant change was the publication of Plant Atlas 2020 (Stroh *et al*., 2022), with the results of twenty years' recording for the BSBI, including a reassessment of the national rarity/scarcity status of our flora. Some register species formerly included by virtue of their previous national rarity/scarcity were found to have increased and conversely others not included have declined. This was an opportunity to reconsider the register list generally, and a number of changes were made in consultation with the Kent Botanical Recording Group. It coincided with the completion of the register accounts and the opportunity was taken of overhauling all the register documentation for consistency, turning the register from draft to final status (subject to annual updating).

4. Criteria

The register focuses on plants which are considered to be native to Kent but does not discount those which are native elsewhere and have reached Kent by 'natural' means. Nor does it discount ancient introductions which are regarded as having the status of archaeophytes[1001], so all references to "native" plants are to be regarded as including archaeophytes. In some cases, the benefit of doubt has been afforded to the inclusion of recently recorded taxa native in the British Isles whose means of arrival in Kent is unclear.

The list of plants has been compiled by using the following criteria.

National rarity or scarcity:

- All Kent native plants were included which are regarded as nationally threatened (for Great Britain), within IUCN-based categories as listed in Cheffings & Farrell (2005). Those categories of threat are: **CR** (critically endangered), **EN** (endangered), **VU** (vulnerable), or **NT** (near threatened). Cheffings & Farrell also have so-called waiting and parking lists of taxa, particularly for those where there are uncertainties. However, the Kent RPR list only includes waiting or parking list plants when there is some other reason to do so, e.g. *Teucrium botrys* (Cut-leaved Germander)[1002].

[1001] An archaeophyte is a plant which was introduced by man (or arrived naturally from an area in which it was present as an introduction) and became naturalised before AD 1500.

[1002] A consequence of this approach is that, if the waiting or parking list status would prevent the plant as being clearly assessed as a native, then its local scarcity status would not qualify it for inclusion - *Cerastium brachypetalum* (Grey Mouse-ear) is an example, with only one site.

- In 2014, threat categories were assessed separately for England (Stroh *et al.*, 2014). The English categories are not necessarily the same as those for Great Britain as a whole. It has been decided to include in the Kent RPR list those plants assessed as **CR**, **EN**, **VU** or **NT** in England, whatever their GB status may be. However, if the English category represents a downgrade from the GB category, this is not treated as a reason to remove any plant from the Kent RPR list.

- All Kentish native plants falling within the following other national categories of protection or rarity / scarcity were included. These categories are:
    - nationally rare plants[1003];
    - nationally scarce plants[1004];
    - Biodiversity Action Plan priority plants (now species of principal importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities Act 2006).

  Listing in Schedule 8 of the Wildlife and Countryside Act 1981 (wild plants protected from picking, uprooting or sale) was noted but not used as a criterion, as it does not necessarily reflect rarity or scarcity (e.g. *Hyacinthoides non-scripta* (Bluebell) is a Schedule 8 plant for the purposes of the sale prohibition). International listing (through the EU Habitats Directive and the Bern Convention) has been considered, but does not add any species which would not have been included through the national categories.

Local rarity or scarcity:

- All native plants **rare** in Kent were included. These were taken as those with three or less sites recorded since 1990. Because the most comprehensive published overall survey data of the administrative county of Kent is Eric Philp's *New Atlas of the Kent Flora* (Philp, 2010), whose records are in terms of tetrads (2 x 2km squares), a tetrad record has been equated, for convenience, with one site. Obviously, this is approximate: a tetrad may have more than one discrete population of a plant, but equally a single population may span a gridline and result in two adjoining tetrad records. Records for the part of vice county 16 (West Kent) which lies outside the administrative county of Kent were not covered by the New Atlas. Data for that area kindly supplied by Rodney Burton were considered, when assessing alternative scenarios as regards whether the register should include or exclude those areas (see paragraph 5 below). In general, post-1990 records not noted by Eric Philp were taken into account where known by the writer, but there will be others not known.

- All native plants **scarce** in Kent were included. These were taken as those with four to ten (inclusive) sites recorded since 1990[1005]. The same principles as regards equating tetrads with sites apply, as with locally rare plants. Native plants with more than ten Kentish sites but which are thought to be in serious decline could also be included. However, in practice it was found that many likely candidates initially qualified for the list on other grounds - e.g. *Clinopodium acinos* (Basil Thyme),

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[1003] The usual definition of nationally rare plants is that they are recorded in not more than 15 hectads (10 km squares based on Ordnance Survey for Great Britain). The status for RPR purposes was taken from the Joint Nature Conservation Committee taxon designation spreadsheet published as at November 2009 (http://www.jncc.gov.uk), but lists of nationally rare and scarce plants are conveniently accessible on the BSBI website, under 'Resources' and Stroh *et al.* (2022) give the status under each plant entry.

[1004] The usual definition of nationally scarce plants is that they are recorded in 16 to 100 hectads (10 km squares based on Ordnance Survey for Great Britain). The status for RPR purposes was taken from the Joint Nature Conservation Committee taxon designation spreadsheet published as at November 2009 (http://www.jncc.gov.uk).

[1005] However, *Potamogeton obtusifolius* (Blunt-leaved Pondweed) was included, notwithstanding that no sites were identified in the survey for Philp (2010). This was on an assumption that an examination of appropriate habitats at the optimum time of year would be more successful; and, indeed, it has since been found.

Omalotheca sylvatica (*Gnaphalium sylvaticum,* Heath Cudweed), *Neottia nidus-avis* (Bird's-nest Orchid)*, Valerianella dentata* (Narrow-fruited Cornsalad) - and the subsequent assessment of conservation status in England given in Stroh *et al*. (2014) has brought in others.

- The result of investigations after the publication of Philp (2010) has on occasion been such as to show that a plant was not rare or scarce in accordance with the preceding criteria after all, in that over ten current sites may have been recorded for the plant. Where a species account has not already been prepared, then the plant will normally be removed from the RPR list and an explanation given as regards its status. Where a species account has already been prepared, then this will be retained, with an option to retain it in the list or to include it in Appendix C to the RPR. This is in order to ensure that information relevant to the assessment of the status of that plant is not discarded.

- The one to three sites (rare) and four to ten sites (scarce) criteria could, on the basis of BSBI guidelines have been applied to the separate vice counties of East and West Kent, rather than Kent as a whole; but on the basis that the register was to be for the whole of Kent, rather than two registers, one for each vice county, the criteria were applied to the whole.

Other criteria:

- The species or microspecies in the complex genera of *Hieracium* (Hawkweeds), *Rubus* (Brambles) and *Taraxacum* (Dandelions) have been excluded, at least for the time being, although consideration is being given to *Hieracium*, for which Shaw (2020) would provide a basis. Data may be found in Philp (2010).

- Treatment of hybrids presents some issues, and the choice may be to a degree arbitrary. There is a case for inclusion of these (cf. Preston, 2004). It may be considered that the register should not be encumbered with fugitive hybrids, but that priority should be given to those with a longer term presence. This criterion on its own, however, still results in a substantial number of plants, many of which may demonstrate not much more than the proximity of parents and the skill of the identifier (although there is room for more than one viewpoint here). The inclusion of hybrids has accordingly been limited to those currently present in Kent which retain the genes of a parent which has become extinct, or is close to extinction, in Kent. The list therefore includes *Schoenoplectus tabernaemontani x triqueter.* On the same principle, the list originally included *Hypericum maculatum x perforatum*, although this was removed on the rediscovery of *Hypericum maculatum* (Imperforate St John's-wort).

- The BSBI guidelines provide scope for including heritage plants, viz. long-established non-native plants which have particular cultural, historical or ecological interest. On this basis, *Malva setigera* (*Althaea hirsuta,* Rough Marsh-mallow) has been admitted to the list, as still being known in Kent in the area where, in 1792, it was first recorded as growing wild in Great Britain. *Chaenorhinum origanifolium* (Malling Toadflax) is also a Kent heritage plant, both in view of its English name and because West Malling is the location of its first record in Great Britain (in 1880) and its most persistent population.

5. Geographic coverage

When the register proposals were first consulted upon, it was assumed that the London Rare Plant Register was in active progress, and so it would not be appropriate for the Kent register to include the metropolitan areas of vc 16. As the London project subsequently appeared to be in abeyance, the case for a Kent register which included the whole of vc 16 (rather than risk leaving an area which ends up without a rare plant register at all) became more substantial. Currently, therefore, the Kent register is intended to cover the whole of vc 15 and vc 16, so extending north to Deptford. This differs from the approach taken by Philp (2010), whose records are delineated by the administrative county boundaries and so omit metropolitan vc 16. Preparation of a London Rare Plant Register has since revived. However, conclusions regarding rarity in the context of Greater London are likely to differ from those in the context of traditional Kent as a whole, so that there is a case for an overlay of registers in metropolitan vc 16.

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Galeopsis angustifolia at Dungeness. Photo by Lliam Rooney, July 2011.